

Part 1 General

1.1 SCOPE OF WORKS

- .1 The list of works listed in this section is indicative and non-limitative. It does not exclude works described in other sections of the specifications, shown on drawings or necessary for a complete execution of the works in the spirit of the plans.
- .2 The present Scope of works applies à to all the new windows (loop holes, acoustical loop holes, passing windows, acoustical passing windows, fixed windows, etc...). The present scope of works must be read together with typical details (sheets a472 and a479).

1.2 RELATED REQUIREMENTS

- .1 Section 06 03 15 –Historic works-repairs by splicing of wood components
- .2 Section 09 91 13 – Exterior painting
- .3 Section 09 91 23 – Interior painting
- .4 Section 07 92 00 – Joint sealants

1.3 REFERENCES

- .1 Architectural Woodwork Manufacturers' Association of Canada (AWMAC):
 - .1 Architectural Woodwork Quality Standards Illustrated, Eighth Edition, Version 2.0, 2005 (referred to hereinafter as "QSI").
- .2 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS)
- .3 The Society for Protective Coatings (SSPC):
 - .1 SSPC-SP5/NACE No.1-2007, White Metal Blast Cleaning.
- .4 CSA Group
 - .1 AAMA/WDMA/CSA 101/I.S.2/A440-08, NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.
 - .2 CSA O112.4-M1977 (R1999), Standards for Wood Adhesives.
 - .3 CSA O112.5-Series-M-1977(R1999), Urea Resin Adhesives for Wood (Room- and High-Temperature Curing).
 - .4 CSA O112.7-Series M-1977(R1999), Resorcinol and Phenol-Resorcinol Resin Adhesives for Wood (Room- and Intermediate-Temperature Curing).
- .5 Master Painters Institute (MPI)
 - .1 MPI Architectural Painting Specification Manual - 2004 (referred to herein as "MPI Manual")

1.4 ACTION AND INFORMATIONAL 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 concerning all materials in the present section for the restoration of windows. Data sheets must include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit complete shop drawings of new pieces of wood (new component and/or splice to Departmental Representative. The dimension, location of piece in relation to the window and it's frame, direction of wood grain and profile of the piece must appear on the shop drawings. They must also include shaping and mounting documents, that is design and assembly details, shaping details, diagrams and mounting instructions as well as list of materials and equipments. Submitted drawings must also indicate sections, assemblies, piercings, threaded fastening devices, rivets, weldings and other required elements such as membranes, adhesives, projected urethane.
 - .2 Submit shop drawings prepared, for all assemblies wood-wood, replica, etc. at half scale or full scale and indicating pertinent details relating to configuration, materials and realization of assemblies.
 - .3 Submit to Departmental Representative for approval, documents giving the description of methods and sequence of works, order of mounting of elements and type of equipment which will be used.
- .4 Product Samples:
 - .1 Submit a sample of all products required and mentioned in the present section for the construction works and installation of the restoration of windows. Without being an exhaustive list, here are the elements for which samples must be submitted for approval:
 - .1 Sealant and color of sealant;
 - .2 Replacement putty around glass panes;
 - .3 Replacement glass;
 - .4 Wood replacement 300x300x50mm (Spanish cedar);
 - .5 All types of wheaterstrips;
 - .6 All items in hardware groups for the existing wood windows;
 - .7 Replacement moldings and new wood components (ex: brick molding, stud, new window sill, replacement jamb);
 - .8 Counterbalance cables ;
 - .9 All anchors and screws;
 - .10 Polyethylene 0.10 mm (6mils) bags for transportation of restored sashes;
 - .11 Aluminum prepainted aerators for demister holes.

1.5 **MOCK-UPS**

- .1 Submit required documents and samples in accordance with Section 01 33 00 - Submittal Procedures.

- .2 Construct full size samples of all assemblies with prescribed materials respecting prescribed tolerances and on which have been reproduced tool marks surveyed on the existing wood pieces.
- .3 Do the following mock-ups of works for approval by Departmental Representative (Notify Departmental Representative 4 working days in advance for inspections);
 - .1 Specialized contractor for window restoration must do restoration of 3 complete windows for approval by Departmental Representative. The sample windows will be chosen by Departmental Representative;
 - .2 do 3 samples of each of typical repairs mentioned in the present section and on Window table (repair of one fissure with epoxy flexible paste, reconstruction of one rotten surface with epoxy flexible paste, etc...);
 - .3 Do replacement of 2 window sill to replace;
 - .4 Do replacement of 3 sections of jamb to replace;
 - .5 Do replacement of 3 brick moldings to replace;
 - .6 Dismantle sashes (vertical sliding and casement) of 3 windows;
 - .7 do stripping of paint on 3 frames on site and their sashes in workshop ;
 - .8 do mist holes with aerators on 3 sashes;
 - .9 Reinstall sashes on three windows;
 - .10 do adjustments of sashes of 3 windows;
 - .11 Do replacement of weather-strips on 3 windows, including sashes;
 - .12 Do joint sealant on three windows;
 - .13 Do cleaning, adjustments and replacement of cables of counterbalancing system on three windows.
 - .14 Do cleaning and removal of anti-fungus coating on 5 glass squares identified by Departmental Representative

1.6 QUALITY CONTROL AND INSPECTIONS.

- .1 Contractor must obligatorily obtain approval of the following works on each new wood window by the Departmental Representative before passing to the following step:
 - .1 works of stripping and surface preparation of (frame and sashes)
 - .2 works of preparation of elements to restore (frames and sashes, fissures, rotten section, etc.)
 - .3 works of restoration and replacement of wood components before painting works;
 - .4 painting works of frames
 - .5 painting works of sashes before transporting them to site.
 - .6 works of adjustments of sashes once installed.
- .2 The specified grades of wood must comply with those defined by the National Lumber Grade Authority or by the Canadian Lumbermen's Association. Each of the wood pieces, before cut on site, must bear a stamp identifying its species and grade.
- .3 All wood must be air dried and have a humidity content inferior to 10%.

- .4 All wood in contact with a waterproof membrane must have a humidity content inferior to 7%.
- .5 Notify Departmental Representative before ordering or buying materials.
- .6 Materials may be examined and approved by Departmental Representative before their purchase by the contractor.
- .7 Keep invoices, purchase orders and supplier certificates allowing to show that used products comply with prescribed requirements.
- .8 Submit, upon request, documents mentioned above to Departmental Representative.
- .9 Ensure Departmental Representative free access to materials so that he may examine them before the beginning of the works

1.7 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 and equipment to site in their original packaging with manufacturer's name and address.
- .3 All sashes restored in workshop will be delivered to site in polyethylene 0.10 mm (6mils) bags sealed in order to avoid damages and soiling. The sashes will be delivered on the scaffoldings maximum 48 hours before their re-installation. The bags must be identified with the window number.
- .4 Storage and Handling Requirements:
 - .1 Store materials and new windows 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 with new, materials and equipment damaged by transportation, storage and/or handling.
- .5 Waste management and disposal:
 - .1 Sort waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .2 Identify hazardous and related materials which are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from the Provincial Ministries of Environment and Regional Levels of Government.
 - .3 Safely store materials defined as hazardous or toxic waste, including emptied containers and application apparatus, in containers or areas designated for hazardous waste and dispose of contaminants in an approved legal manner.

1.8 PROTECTION

- .1 Protect all elements of this section, until final acceptance, against all messes, damages and soiling what so ever. Protect works of other sections against messes, soiling and damages caused by demolition operations and installation of new windows and/or sashes.

- .2 All damaged materials and windows as well as their components must be replaced by new materials/windows/sash of same quality, and the whole restored to new and good state to satisfaction of Departmental Representative without additional charges.

1.9 CONDITIONS OF INSTALLATION

- .1 At the end of each work day, cover the works exposed to bad weather with waterproof tarps. Solidly anchor in place the coverings.
- .2 Repairs with flexible epoxy paste:
 - .1 Maintain temperature of elements to repair between 21 °C and 24 °C through and through during 48 hours after repair.
 - .2 Provide a temporary shelter and heating and cooling equipment required to maintain the prescribed temperatures.
 - .3 Undertake the works with a relative humidity level identical to the level of operation required for the finish product.

1.10 DESIGN REQUIREMENTS

- .1 The project concerns an historic building; the objective of the works is to repair as much as possible the existing materials instead of replacing them. The repair and restoration works of missing elements must match the existing works.

1.11 SCHEDULE OF WOODWORKS

- .1 Submit a work schedule indicating, by steps, the progression of works up until the date of completion specified in the tendering documents.
- .2 The works schedule must indicate the dates of delivery of materials and equipment.

1.12 ACCEPTABLE PRODUCTS AND MATERIALS

- .1 Where a particular brand name is stipulated, see Instructions to Bidders for procedure for requesting approval of substitute materials and products

Part 2 Products

2.1 PRODUCTS

- .1 **Wood blockings**
Spruce: must be Eastern spruce (Picea Glauca) construction grade #1 or better, sanded 4 sides. Nailing strips must be pressure treated wood.
- .2 **Moldings , studs, woodworks and new sills**
Spanish Cedar: must be Spanish Cedar construction grade #1 or better, sanded 4 sides. Pieces containing too many knots or imperfections will be refused.
- .3 **Dowels and pegs**
Dowels and pegs: wood of same essence as pieces to fix. Dimension pegs and dowels in relation to pieces they must support à and/or maintain.

- .4 **Wood plugs**
Cover bolts, lag bolts and other various anchors with wood plugs cut from wood slices of same essence as existing elements. The grain direction of slice must be oriented in the same direction as the one des of existing pieces. Nails, bolts, screws, washers and other hardware pieces: must be conforming to standard ACNOR B111-1974, in hot-dipped galvanized steel. Dimensions: at least 1/2 inch thick, of diameter ensuring a tight adjustment and flush in the cavity left by the bolt.
- .5 **Adhesives**
Sink the dowels; piece inserts of wood in a bed of adhesive based on resorcinol, phenol-resorcinol or epoxy resins.
- .6 **Plywood**
Western BC-Fir plywood of Canada Exterior Grade: must be in conformance to standard 0121-1978 of CGSB for exterior use high density plywood. Unless indicated otherwise on drawings or specifications, plywood must be grade "good one side " and sanded for paint finish when one face is destined to be exposed to view, and of grade " Sheathing " elsewhere.
- .7 Anti-fungus treatment must be made with base of pentachlorophenol, tinted green, and in conformance to appropriate clause of standard 080-1974 of CGSB for Anti-fungus treatment
- .8 Nails, bolts, screws, washers, pins anchors and other hardware pieces: must be in conformance to standard CGSB B111-1974, in stainless steel.
- .9 The weatherstrips around sashes to be of synthetic fiber and weatherstrips elsewhere on the window are of type Q-Ion with silicone bubble.
- .10 Setting blocks must be of neoprene 80-90 Shore A durometer hardness f and and Spacer shims must be of neoprene 50-60 Shore A durometer hardness
- .11 Filler: conceived for exterior use and tinted to harmonize with paint color.
- .12 Wood finish: Spar varnish according to prescriptions of section 09 91 13 – Exterior Painting .
- .13 Sodium hydroxyde Solution (NaOH) of appropriate concentration to use.
- .14 Size of granulate for jet stripping: according to SSPC-SP5

2.2 DIVERSE ROUGH CARPENTRY

- .1 The diverse rough carpentry must be spruce, unless otherwise indicated on drawings, and must be installed in massive pieces, of size and dimensions appropriate for the work; or in BC-Fir plywood from Western Canada of 19 mm thick unless another thickness is indicated on the drawings, and must be bolted, screwed or nailed in place in the manner most appropriate to needs of the works with a minimum of 2 fasteners per square foot of wood, measured on the face of direction.

2.3 NAILING BACKING

- .1 Unless otherwise indicated on drawings, nailing backings necessary for the installation of finished woodworks, and other works, must be pressure treated spruce of appropriate dimensions, and must be solidly fastened in place.

- .2 Except if otherwise specifically indicated on drawings and specifications, all elements of woodworks that are not free-standing or are supported fully and continuously must be yellow pine.

2.4 BLOCKINGS

- .1 Blockings required for the installation of other materials, and at wall junctions, must be in spruce of 45 mm thick, unless another thickness is indicated on drawings; they must be fastened in place with bolts, washers, nuts, in sufficient numbers to ensure their rigidity and all rigidly anchored.

2.5 SURFACE PREPARATION AND WOOD RESTORATION WORKS

- .1 Reconstitution paste for deteriorated wood elements: Use epoxy flexible paste to reconstruct partially (less than 50 mm cubic) elements to preserve which have superficial rot or to fill fissures in the wood element. Apply a consolidating compound as primer on all surfaces destined to receive the epoxy flexible paste. **IMPORTANT**: It is formally forbidden to use flexible epoxy for resurfacing wood elements or for too large reconstructions.
- .1 Acceptable material for consolidating compound:
- .1 Liquidwood by Abatron
 - .2 Replacement materials: approved by addenda according to Instructions to tenderers
- .2 Acceptable material for flexible epoxy paste:
- .1 Wood epoxy by Abatron
 - .2 Replacement materials: approved by addenda according to Instructions to tenderers
- .2 Filling paste: Use flexible epoxy paste to fill all small holes and orifices in existing woodwork to preserve. Apply a consolidating compound as primer on all surfaces destined to receive the epoxy flexible paste. **IMPORTANT**: It is formally forbidden to use flexible epoxy for resurfacing wood elements or for too large reconstructions
- .1 Acceptable material for consolidating compound:
- .1 Liquidwood by Abatron
 - .2 Replacement materials: approved by addenda according to Instructions to tenderers
- .2 Acceptable material for flexible epoxy paste:
- .1 Wood epoxy by Abatron
 - .2 Replacement materials: approved by addenda according to Instructions to tenderers
- .3 Primer for knots, veins, spots etc. Primer applied in 1 coat at certain places only.
- .1 Acceptable Materials for primer:
- .1 B. I. N Shellac-Base Primer Sealer Ultimate Performance Primer-Sealer for interior and spot exterior use by the company Zinsser North America
 - .2 Replacement materials: approved by addenda according to Instructions to tenderers

2.6 FINISHING REQUIREMENTS

- .1 Sand the works so they will be smooth and sink in apparent screws and nails.
- .2 Apply filler in the cavities of apparent screws and nails and sand.
- .3 Apply a primer in workshop on all surfaces according to work standards described in the "MPI" manual.
- .4 See section 09 91 13 – Exterior painting .

Part 3 Execution

3.1 EXAMINATION AND DOCUMENTATION OF EXISTING CONDITIONS

- .1 Before the beginning of the works, Contractor must submit a general photo (interior and exterior) of each window in contract in order to document the existing. Photos will be submitted to Departmental Representative on a DVD for approval before starting the works.

3.2 DISMANTLING OF SASHES

- .1 All the sashes of the guillotine windows must be dismantled by removing the moldings on the brick at exterior and by dismantling one of the two studs which will be replaced by a new stud. Sashes will be brought afterward to workshop to be restored. The sashes will be reinstalled once restored. All brick moldings on all windows will be new, with same dimensions and profile as the existing molding.
- .2 All casement sashes must be dismantled by removing hinges, and afterward brought to workshop to be restored. The sashes will be reinstalled once restored.
- .3 All sashes restored in workshop will be delivered to site in polyethylene 0.10 mm (6mils) bags sealed in order to avoid damages and soiling. The sashes will be delivered on the scaffolding maximum 48 hours before their re-installation. The bags must be identified with the window number.
- .4 Identify each of the windows on the site with the individual identification number indicated on the drawings. Contractor must ensure adequate protection against dust and bad weather once sashes are dismantled.
- .5 Apply projected polyurethane foam insulation with low expansion in the cracks around the frame of each of the windows.

3.3 WINDOW SILLS TO REPLACE (WHEN INDICATED ON WINDOW TABLE)

- .1 Replace the existing window sill by a new massive Spanish cedar sill (no assembly) as indicated on typical details. Apply 3 coats of solid color wood stain of the same color as the existing. wait 48 hours between coats. Provide a color sample to Departmental Representative for approval. Primer and two first coats of stain will be applied in workshop on the sashes whereas the last coat will be applied on site.

3.4 ROTTEN WOOD AND REPAIRS

- .1 Replace all rotten wood on windows identified on window table and according to typical window details. The works of replacing rotten woods must also include all required related works such as dismantling of glass panels and of sashes, etc
- .2 Once all sashes, frame and moldings to preserve are stripped and sanded, proceed with repairs of all fissures, holes, cracks and spacing between moldings and frame with a flexible epoxy paste. Remove rotten wood up to sound wood and apply a wood consolidating liquid compound on the sound wood before repairing with a flexible epoxy paste. It is formally forbidden to completely resurface wood components of the window with flexible epoxy paste. Rotten wood reconstructions with epoxy paste must not be bigger than 25 x 25 x 25 mm. Reconstructions greater than 25 x 25 x 25 mm will be done with Dutchmen. Fissures identified on window table must be considered as major. The average width of fissures to repair is 6mm and more and average length is 450mm. Complete the sections of missing elements with wood insertions and Dutchmen or reconstructions with epoxy paste if repair dimensions to do are less than 25 x 25 mm. re-sand the interventions before applying the solid color stain.
- .3 Strip and sand all windows (frame, sashes in both sides, moldings and all the interspace between window and double window). Apply 3 coats of solid color wood stain of the same color as the existing. Wait 48 hours between coats .See drawings for color schemes.

3.5 NEW MOLDINGS AND SILLS

- .1 All new moldings will be made of Spanish Cedar and produced in workshop (brick moldings, studs, new sills, guides, parts of frame). Moldings must be painted in workshop (primer and 2 coats+ 1 coat on site) and on all surfaces – even concealed surfaces. All cuts done on site must be painted (primer + 3 coats) on end of wood.

3.6 STUDS TO REPLACE

- .1 Studs which are removed to dismantle sashes must be replaced by new Spanish cedar studs.

3.7 SCREWS AND ANCHORS

- .1 All nails, screws and other anchors used for works on windows must be made in stainless steel (grade 316).

3.8 COUNTERWEIGHT SYSTEM AND ACCESS DOORS

- .1 Restore access to counterweight system by replacing access doors and making them easily removable. Replace all the counterweight system in all windows. Replace pulleys by new ones in galvanized steel, replace cords par by new ones in nylon 6mm diameter. Counterweights of each of the windows must be adjusted by adding weights to sash counterweight until they stay in place. Plan an adjustment of the mechanism when a sash is stuck.

3.9 MIST HOLES AND AERATORS

- .1 Do the piercings in workshop and install prepainted aluminum aerators of the same color as the windows on the sashes of the exterior window. Condensation holes will have a diameter of 16mm. Provide 3 mist holes at the bottom of bottom sash and 3 others on the top sash. The wood inside mist holes must be stained with 3 coats of solid color stain.

3.10 ADJUSTMENT OF WINDOWS

- .1 Adjust the interior and exterior sashes of all windows. The adjustment intervention of windows consist of installing *sapelli* sifflets having the width of the sashes and screwed to the window frame at the bottom of the bottom sash and at the top of the top sash if the movement is longitudinal. Once the sifflets are installed and window is adjusted, there must be a gap of 2mm between the sash and the frame/ guides for good operation of sashes.

3.11 GLASS PANELS AND PUTTY

- .1 Replace the putty of all glass panels of all windows in the contract. Use a putty containing at least 50% linseed oil. Putty must be paintable.
- .2 Replace all broken glass panels according to window table. Replacement glass must be identical to existing glass that is clear glass 4mm or 6mm thick according to surface of glass panel.

3.12 WEATHERSTRIP

- .1 Replace all existing weather-strips of sashes of all the windows. Make a new groove in workshop on the side of all guillotine sashes to insert a new synthetic fiber weather-strip inserted and fixed in the new groove. Install new weather-strips on all windows in the contract, as shown in typical details. The new weather-strips will be of synthetic fiber or silicone when indicated.

3.13 CLEANING OF GLASS PANELS OF WINDOWS

- .1 The glass panels of casement and guillotine sash windows are covered with an anti-fungus covering which has been applied after the fire. The totality of glass panels of all existing interior windows and double windows in the contract are to be preserved and to be cleaned to remove the anti-fungus covering in totality without damaging or scratching the existing glass.

3.14 HARDWARE

- .1 Replace all hardware elements of all guillotine sash windows and casement windows (hinges, handles, lifting handles, pulleys, latches, casement window locks). See hardware table.

3.15 SEALANT JOINTS

- .1 Redo all sealant joints at perimeter of all windows, including joints between the brick wood molding and the masonry as well as the joints between this molding and the wood window frame. Use a silicone base sealant of the same color as the solid color stain of the windows. Submit sealant color and work mock-up to Departmental Representative for his approval. All cables and pipes or fillings which pass through frames and sashes must be sealed with this same sealant.

3.16 CLEANING OF WINDOWS

- .1 Clean all windows and secondary storm windows of all dirt and mortar residues on glass panels and on painted or varnished wood elements at the end of the works and to satisfaction of Departmental Representative. Provide an adequate protection to windows throughout the works with sealed polyethylene sheets. Contractor must enclose zones where there are paint and woodworks with dustproof tarps.

3.17 SEQUENCE OF WORKS

No masonry works will be authorized in a radius of 8 meters of current paint or woodworks. Contractor must enclose sections where there are window works at the same time as masonry works in a radius of 8 meters. Contractor will have to repaint the windows if he has not respected these requirements/or if protection against dust has been insufficient according to Departmental Representative.

END OF SECTION