

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")
- .6 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-12.3-M91 Flat, Clear Float Glass
 - .2 CAN/CGSB-12. 8-M97 Insulating Glass Units.
 - .3 CAN/CGSB-12.1M90, Tempered or Laminated Safety Glass
- .7 American Society for Testing and Materials (ASTM):

- .1 ANSI/ASTM E330-90, Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
- .2 ASTM C542-90, Specification for Lock-Strip Gaskets.
- .3 ASTM D2240-91, Test Method for Rubber Property - Durometer Hardness.
- .4 ASTM E84-91a, Test Method for Surface Burning Characteristics of Building Materials.
- .5 ASTM F1233-92, Test Method for Security Glazing Materials and Systems
- .8 Flat Glass Manufacturers Association (FGMA) Glazing

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 windows to Departmental Representative. Shop drawings must include the following informations: the plans and elevations of elements, materials, dimension and profile of all components of new windows relating to sashes and frames, direction of wood grain of components, shaping and mounting documents, location of weather-strips, location of sound breaks and absorbing acoustical treatment, conception and assembly details, shaping details, joint details, glazing details, interior and exterior fittings, anchor details, preventive treatment, description of related components, fastenings and sealant products, diagrams and mounting instructions as well as lists of materials and equipment. 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 new 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 Fixation strips around glass panes;

- .3 Acoustical insulating glass (exterior sash);
- .4 Non-acoustical insulating glass;
- .5 Simple glass (interior sash);
- .6 Wood for construction of windows 300x300x50mm (Brazilian mahogany);
- .7 All types of weatherstrips;
- .8 All items in hardware groups for the new wood windows;
- .9 All types of sound-breaks;
- .10 All materials of absorbing treatment;
- .11 Perforated enamelled aluminum sheet in air space of acoustical windows;
- .12 All anchors and screws;
- .13 Provide a model window complete at scale 1:1 for each of the types of new wood windows (fixed windows, non-acoustical loop hole window, acoustical loop hole window, non-acoustical passing window, acoustical passing window, etc...). Model windows must include all components indicated on drawings (sound-breaks, absorbing treatment, weatherstripping, insulating glass, hardware, perforated enameled aluminum sheet, etc...)

1.5 MOCK-UPS

- .1 Submit required documents and samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Once samples of model windows are approved, do mock-ups of works and an exemplary installation of all types of new windows according to the following list (notify Departmental Representative 4 working days in advance for inspections);
 - .1 Contractor must install an acoustical passing window (NON-PAINTED) according to shop drawings reviewed by Departmental Representative. Mock-up of work must also include all related works to the installation of the window, such as the interior wood shelf, **the lighting system of the window** (see engineer for lighting), membranes, insulation, acoustical treatment, all finishing moldings, framings, etc... Location of the mock-up work will be determined by Departmental Representative.
 - .2 Contractor must install an acoustical loop-hole window (NON-PAINTED) according to shop drawings reviewed by Departmental Representative. Mock-up of work must also include all related works to the installation of the window, such as the interior wood shelf, **the lighting system of the window** (see engineer for lighting), membranes, insulation, acoustical treatment, all finishing moldings, framings, etc... Location of the mock-up work will be determined by Departmental Representative.
 - .3 Accepted Mock-up of work may be part of the finished work.
 - .4 Accepted Mock-up of work will be the standard of acceptance for the works of the present section.

1.6 QUALITY CONTROL AND INSPECTIONS

- .1 Do the works according to QSI Section 1000, Windows, Premium Grade quality.

- .2 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 Review of shop drawings;
 - .2 Review of model windows;
 - .3 Review of Mock-ups of works;
 - .4 Inspection of windows before application of paint finish;
 - .5 Inspection of sound-breaks and weather-stripping;
 - .6 Inspection of windows on the site before their installation.
- .3 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 it's species and grade.
- .4 All wood must be air dried and have a humidity content of 10%.
- .5 All wood in contact with a waterproof membrane must have a humidity content inferior to 7%.
- .6 Notify Departmental Representative before ordering or buying materials.
- .7 Materials may be examined and approve by Departmental Representative before their purchase by the contractor.
- .8 Keep invoices, purchase orders and supplier certificates allowing to show that used products comply with prescribed requirements.
- .9 Submit, upon request, documents mentioned above to Departmental Representative.
- .10 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 new windows to site in plywood cases labelled with manufacturer's name and address and in a manner to avoid any breakages, clashes and/or deformations, to avoid damaging finishes and any theft and vandalism. The new windows and sashes must be well packaged, solidly, with protection of edges and corners.
- .3 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 windows damaged by transportation, storage and/or handling according to assessment of Departmental Representative.
 - .4 Protect works against mildew according to QSI Section 1700, Installation.
- .4 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 new wood windows, until final acceptance, against all 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 Maintain conditions of installation (temperature, humidity and ventilation) inside the limits recommended by the manufacturer to obtain optimum results. Do not install the windows in installation conditions which exceed the absolute limits of the manufacturer.

1.10 DESIGN REQUIREMENTS

- .1 Acoustical windows: The passing acoustical windows and the loophole acoustical must have an acoustical performance of STC 60. The interior sashes of the new wood passing windows are casement whereas the exterior sashes are fixed. The interior sash of all the new wood windows is operable (opening).
- .2 AIR-INS Requirements
Airtightness: A3/F required
Resistance to water penetration: B7 required
Resistance to wind loads: C3 required
Resistance to condensation: CAN/CSA A440-00
.1 Ig = Glass rating: 68.9
.2 If = sash rating: 55.4
Resistance to tearing chassis: the camber for each rib must not be superior to 75% of the stop.
Resistance to blockings: no damage, deformation or de disengagement of glazing more than 75% of stop under a force of 400 N applied to the operation handle.

1.11 SCHEDULE OF MANUFACTURING AND INSTALLATION OF NEW WOOD WINDOWS

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

1.12 PERFORMANCE CHARACTERISTICS OF GLASS

- .1 The interior glass of insulating glass units with multiple glasses forms a continuous barrier to air and water vapor.
- .2 The dimensions of glazing must be determined so as to resist to permanent loads, to overloads due to wind as well as pressure and suction loads of wind according to calculations done according to standard ANSI/ASTM E330.
- .3 The maximum bending of glazing must not exceed 1/200, without alteration of physical properties of glazing materials.

1.13 QUALITY ASSURANCE OF GLAZING

- .1 Execute the works according to instructions given in the FGMA Glazing Manual concerning types of mounting of glass panels.

1.14 MAINTENANCE SHEETS

- .1 Provide necessary maintenance instructions sheets.

1.15 COORDINATION MEETINGS WITH CONTRACTOR AND SPECIALIZED SUBCONTRACTORS

- .1 The following meetings with the Departmental Representative, the Contractor and his specialized Subcontractor are obligatory:
 - .1 Start off meeting before the beginning of the shop drawings;
 - .2 Meeting to review shop drawings;
 - .3 Meeting to review model windows;
 - .4 Meeting before mock-ups construction;
 - .5 Meeting before installation of windows on site.

1.16 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 FRAME AND SASH

- .1 Lumber: Brazilian mahogany quarter cut, average humidity content of 7 %, maximum 9 %. Grades AWMAC as follows :
 - .1 Apparent and semi-apparent surfaces : grade I.
 - .2 Concealed surfaces : grade II.
- .2 Adhesive: waterproof as recommended by manufacturer.
- .3 Filler: conceived for exterior use and tinted to harmonize with paint color.
- .4 Fastenings: in stainless steel, of type and dimension appropriate for projected use.
- .5 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.
- .6 Screws, bolts and fastenings must be of stainless steel alloy 18/8 according to standard of A.I.S.I.

2.2 FINISHING

- .1 Primer: MPI n° 5, alkyd/oil primer for exterior wood, selected from « MPI Green Approved Products List ».
- .2 Wood window finishing: as per section 09 91 13 – Exterior painting .

2.3 SEALANT PRODUCT

- .1 Sealant product must be a silicone base sealant (see Section 07 92 00 – Joint sealants conforming to standard CAN2-19.13-M82.

2.4 INSULATING UNIT, DOUBLE GLASS INTERIOR SASH ACOUSTICAL WINDOWS (including transoms and casements)

- .1 Insulating units: according to standard CAN/CGSB-12.8, as follows:
 - .1 Outer light: Flat, Clear Float Glass, transparent, as per standard CAN/CGSB-12.3. Thickness: 6 mm.
 - .2 Inter-cavity space: 25 mm, with low conductivity spacers, argon filled.
 - .3 Inner light: Flat, Clear Float Glass, transparent, as per standard CAN/CGSB-12.3. Thickness : 4 mm.
 - .4 Glass coating: surface number 3, low "E".
 - .5 Physical properties of insulating unit:
 - .1 Visible Light transmittance: 57%
 - .2 Exterior Reflection : 16%
 - .3 U-Value winter: 0,18
 - .4 Shading co-efficient: 0,29
 - .5 Gain of solar heat Coefficient: 0,25
 - .6 Gain of relative heat: 59,62 BTU / hre / sq. ft.

2.5 SIMPLE GLASS EXTERIOR SASH ACOUSTICAL WINDOWS (including transom)

- .1 Flat, Clear Float Glass, transparent, as per standard CAN/CGSB-12.3. Thickness: 8 mm.

2.6 INSULATING UNIT, DOUBLE GLASS NON-ACOUSTICAL WINDOWS

- .1 Insulating units: according to standard CAN/CGSB-12.8, as follows:
- .1 Outer light: Flat, Clear Float Glass, transparent, as per standard CAN/CGSB-12.3. Thickness: 6 mm.
 - .2 Inter-cavity space: 20 mm, with low conductivity spacers, argon filled.
 - .3 Inner light: Flat, Clear Float Glass, transparent, as per standard CAN/CGSB-12.3. Thickness : 4 mm.
 - .4 Glass coating: surface number 3, low "E".

2.7 GLAZING ACCESSORIES

- .1 Setting blocks: neoprene,80-90]Shore A durometer hardness to ASTM D2240, minimum 100 mm x width of glazing rabbet space minus 1.5 mm x height.
- .2 Spacer shims: neoprene,50-60 Shore A durometer hardness to ASTM D2240, 75mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face.
- .3 Glazing tape for glazing:
- .1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D2240; coiled on release paper; 5 mm x 13 mm; black colour.
 - .2 Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume 2 %, designed for compression of 25 %, to effect an air and vapour seal.
- .4 Glazing splines: wood, of same essence as the sashes, molded same as frames of existing sashes, painted as the sashes, color to determine.
- .5 Sealant product : acetoxysilicone base sealant product, humidity hardened, single component, according to standard ASTM C920, type S, grade NS, use NT, G, A et O; applies easily with pistol in all conditions, color transparent
- .6 Glazing clips: manufacturer's standard type.
- .7 Lock-strip gaskets: to ASTM C542

2.8 ACOUSTICAL TREATMENT

- .1 Silicone sound seal as illustrated in drawings.
- .2 Absorbing band in inter-cavity space composed of enameled perforated aluminum sheet at 20% of openings on a mineral fiber blanket of 25mm thickness on the whole perimeter of the inter-cavity space .
- .3 There is a space of 200m in between glass of exterior sash and exterior glass of interior sash.

2.9 WINDOW SHELVES

- .1 The shelves of the passing windows and loophole windows are of massive Brazilian mahogany according to dimensions and profile illustrated on drawings.
- .2 Shelves wood finishing: as prescribed in section 09 91 23 – Interior Painting .

Part 3 Execution

3.1 CONSTRUCTION OF WINDOWS

- .1 Passing windows and loophole windows (acoustical and non acoustical): The ventilation of windows will be assured by the bottom and the top of exterior sashes which will rest on high density nylon chips of 6mm thick with integrated nail and installed on the bottom edge of exterior sashes. The same setback of 6mm must be provided at the top of exterior sash (without chip) from the frame in order to create a chimney effect and adequate ventilation between the window and the secondary window. A space of 200mm separates the window from the secondary window. Interior sashes are casement while the les exterior sashes (secondary window) are fixed.
- .2 Hardware: all hinges and bolts are surface mounted. See hardware table and section.

3.2 EXAMINATION

- .1 Examine areas and conditions in which works must be done and notify Departmental Representative in writing of conditions which could compromise appropriate execution of works.
- .2 Ensure that openings in the masonry wall are ready to receive the windows.
- .3 Ensure that backings and supports are adequate.
- .4 Take measurements on site to verify or complete given measurements.
- .5 Do not undertake the works before unacceptable conditions have been remedied to satisfaction of installer and of Departmental Representative.

3.3 PREPARATORY WORKS

- .1 Do not undertake the works before that all masonry repair works in the area of installation of the windows have been executed, reviewed and accepted by Departmental Representative.
- .2 Clean surfaces well before installation.
- .3 Clean surfaces of contact with a solvent and dry with cloth.
- .4 Seal backset surfaces and porous glazing profiles with a primer paint or a sealant product compatible with the support.
- .5 Apply primer paint on surfaces to be covered by a sealant product.

3.4 ON SITE MEASUREMENTS

- .1 The window manufacturer must measure rough openings in existing walls and reconstructed masonry walls before putting in production the new windows. The measurements taken by the manufacturer and the contractor must be transmitted to Departmental Representative before putting in production the new windows.

3.5 INSTALLATION OF WINDOWS

- .1 Install the windows according to standard CAN/CSA-A440.
- .2 Install the sashes according to manufacturer's instructions as well as reviewed and accepted shop drawings and according to standard AAMA/WDMA/CSA/101/I.S.2/A440 and QSI, Section 1700, of superior quality.
- .3 Install and fix materials and components in place, level, plumb, square and aligned, without distortion of elements from frame, so that they fit with precision to windows.
- .4 Anchor windows laterally and deeply in the nailing backings and masonry.
- .5 Sink in apparent screws and nails and apply filler in the formed cavities and sand.
- .6 Isolate all slits the most deeply possible around window frames in contact with exterior wall and around original frames with a type A projected polyurethane foam, having minimal expansion, according to standard CGSB 51-GP-23M, grade 1. Installed on a "Bond breaker tape".
- .7 Do all necessary restoring of existing exterior finishes and install finishing moldings at indicated locations on plans.
- .8 Install acoustical materials as indicated on plans between interior and exterior sashes.

3.6 INSPECTION FOR GLAZING

- .1 Verify that openings made for glazing are well dimensioned and respect admissible tolerances.
- .2 Verify that backset surfaces as well as those of glazing profiles are clean and exempt of any obstruction, and that they are ready to receive the glazing.

3.7 EXTERIOR GLASS PANELS

- .1 Cut the self-adhesive glazing tape to appropriate length and set against permanent stops, at 6 mm below sight line. Seal corners by butting tape and dabbing with sealant.
- .2 Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.
- .3 Place setting blocks at 1/4 intervals of the width of glass panel in a manner that edge blocks are at a maximum 150 mm from corners.
- .4 Rest glazing on setting blocks and push against tape and heel head of sealant with sufficient pressure to attain full contact at perimeter of light or glass unit.
- .5 Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line. Place glazing tape on glazing light or unit in a manner that it is flush with it and is 16 mm below sight line.

- .6 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.
- .7 Apply cap head of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.8 PAINT WORKS

- .1 Do paint works according to Section 09 91 13 – Exterior Painting. Apply two coats of paint in workshop + primer and last coat of paint on site. Also paint at factory all concealed surfaces of wood assemblies .
- .2 Touch-up primed surfaces which have been damaged during installation with prescribed primer so they will be ready to receive the finishing paint by section 09 91 23 – Interior Painting.

3.9 CAULKING

- .1 Apply sealant product according to prescriptions of Section 07 92 00 – Joint sealants. Conceal sealant product inside the window, except at perimeter of window frame in contact en contact with masonry.

3.10 CLEANING & PROTECTION

- .1 Excess materials and stains which may cause difficulties at final cleaning must be removed as works progress.
- .2 Works must be protected against everything which could degrade or damage them, by covering them temporarily. All temporary coverings must be removed before acceptance of the works.
- .3 At the end of the works, all wood and glass surfaces must be in a perfect state of cleanliness, without stains, dirt and discolorations.
- .4 Remove excess sealant product and visible labels from glass surfaces. Clean the glass surfaces in greatest detail after installation.
- .5 Install and maintain all required protection means and take all necessary precautions to ensure that windows will be in excellent state at the moment of substantial completion of works and to satisfaction of Departmental Representative.
- .6 Remove from finished surfaces all putty or compound used for installation of glazing.
- .7 Remove all labels, once the works are completed.
- .8 Clean the glass panels.
- .9 The glass panels must be, (once put in place), be marked by an "X" with a removable plastic tape.

END OF SECTION