
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 works of the present section concern the restoration of 4 historic existing doors of the Armoury:
 - .1 The door of west square tower on North façade
 - .2 The door of east square tower on North façade
 - .3 The door of south-east tower of East wing
 - .4 The back door on south façade of East Wing leading to yard.

1.2 RELATED REQUIREMENTS

- .1 Section 08 52 05 – Replacement of wood windows
- .2 Section 08 03 14 – Historic works – wood door repairs.
- .3 Section 08 50 00 – New wood windows
- .4 Section 08 52 05 – Historic works - Existing wood windows
- .5 Section 09 91 13 – Exterior painting works

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

1.4 SUBMITTALS

- .1 Data sheets:
 - .1 Submit data sheets for the epoxy wood adhesive.
 - .2 Include application instructions for prescribed materials.
 - .3 Submit two copies of Material Safety Data Sheets (WHMIS) in accordance to prescriptions of section 01 35 29.06 – health and safety, for epoxy repair products. Indicate VOC content.
- .2 Submit require shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

- .3 Submit shop drawings prepared, at a scale of 1: 5, for the splicings and indicating pertinent details relating to configuration, materials and realization of assemblies. Provide shop drawings for the restoration works of the historic doors. Drawings must illustrate the locations and dimensions of components to replace as well as the method of anchoring of the new pieces of wood.
- .4 Provide, at request of Departmental Representative, invoices, purchase orders, and suppliers' certificates of tests realized by the supplier and all other documents allowing to establish the conformity of used materials to specification prescriptions. Allow free access to source provision of supply of materials.

1.5 MOCK-UPS

- .1 Contractor must make the following mock-ups for approval of the Departmental Representative **before** proceeding to works.
 - .1 Repair of 5 fissures with epoxy paste flexible and pigmented for wood.
 - .2 5 surface repairs with epoxy paste flexible and pigmented for wood.
 - .3 Stripping of wood on 1 sq. meter of 1 door varnished in workshop
 - .4 Stripping of wood on 1 sq. meter of 1 door painted in workshop
 - .5 Varnish application on 1 door.
 - .6 Paint application on 1 door.

1.6 QUALITY ASSURANCE

- .1 Notify Departmental Representative before ordering or buying materials.
- .2 Departmental Representative will examine and approve materials before Contractor buys them.
- .3 Allow Departmental Representative free access to materials for inspection before undertaking the works on the site.
- .4 It is formally forbidden to undertake the following stages without approval of Departmental Representative:
 - .1 Photographic documentation of existing conditions of doors.
 - .2 Labeling and documenting doors;
 - .3 Protection of doors and transportation to workshop.
 - .4 Preparation of surface of doors with a view to stripping them.
 - .5 Stripping of doors.
 - .6 Application of paint and/or varnish
 - .7 The Departmental Representative must obligatorily inspect each of the doors BEFORE transporting them to the site.
 - .8 Protection of doors and transportation to site.
 - .9 Reinstallation of restored historic doors.

- .5 Adjust techniques as directed by Departmental Representative until desired results are achieved. Steps or processes approved by Departmental Representative serve as the standard for subsequent work.
- .6 Do welding work in accordance with CSA-W59, unless otherwise specified.

1.7 EVALUATION OF EXTENT OF REPAIR WORKS

- .1 Once doors are delivered to workshop, contractor must do a review of interventions of restoration and replacement of damaged components with the Departmental Representative. No work must be done on the doors before this inspection at the workshop. Notify Departmental Representative 10 working days in advance.
- .2 On the drawings provided by Departmental Representative, hold a precise and updated record of all conditions which have not been seen or necessary repair works additional to those already indicated on the drawings. Bring these drawings at each site meeting for the purposes of reviewing, adjusting and updating them according to the instructions of Departmental Representative.

1.8 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 works described in this section;
 - .2 Meetings and inspection visits to workshop of specialized Subcontractor.
 - .3 Coordination meeting before reinstallation of historic doors.

1.9 ENVIRONMENTAL REQUIREMENTS

- .1 Comply to requirements of Workplace Hazardous Materials Information System (WHMIS) relating to use, handling, storage and disposal of hazardous materials and labeling and provision of Material Safety Data Sheets.

1.10 PHOTOGRAPHIC DOCUMENTATION OF EXISTING CONDITIONS

- .1 Do a photographic survey of all surfaces and of all sides of each patrimonial door in order to document their existing conditions. These photos must be of professional quality and high resolution. Submit the photographic survey to Departmental Representative for approval before transporting the doors. Document by numerical photography and with measured and annotated drawings, the existing conditions of historic doors.

1.11 PROTECTION AND TRANSPORTATION OF PATRIMONIAL DOORS

- .1 Construct 19mm plywood boxes big enough to contain the doors individually. The doors must be padded and the plywood boxes must be covered with rigid insulation inside on all sides. Put the doors in the boxes and fill all voids in the box with balls of expanded rigid insulation. Mark the number of the door on the box.
- .2 Do not pile doors in the boxes.

- .3 Never slide or drag historic doors.
- .4 Construct a test box for approval of Departmental Representative before producing all the plywood transport boxes. The Departmental Representative must inspect all the doors in the plywood boxes before their closure and transport. This requirement applies also for the transport from the shop to the site.
- .5 The doors of the Armoury are dated of 1913 and are relatively fragile. Handling and transport must be delicate and meticulous.
- .6 The use of the same plywood protection boxes is permitted for the transport of doors from the shop to the site. However Departmental Representative must validate the state of the boxes beforehand and approve their use.
- .7 All damages caused to doors due to handling and/or transport, must be repaired at the expense of the contractor and to satisfaction of Departmental Representative.
- .8 The 3 exterior doors of East Wing on north façade (at location of future bridge) which will not be reinstalled must be meticulously dismantled and handed over to Departmental Representative.

1.12 DELIVERY, STORAGE AND HANDLING OF MATERIALS FOR RESTORATION OF DOORS

- .1 Packaging, delivery, storage and unloading.
 - .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
 - .2 Store materials in dry location well ventilated, off ground, sheltered from rain, snow and sun.
- .2 Waste Management and disposal:
 - .1 Sort 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.

1.13 AMBIENT 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 covering.
- .2 Adhesive repairs:
 - .1 Maintain temperature of elements to be repaired at between 20 degrees C and 25 degrees C throughout its thickness and for 48 hours after repairing.
 - .2 Provide heating cooling equipment necessary to maintain temperatures specified.

- .3 Undertake work under conditions of relative humidity at same level as operational requirements of end product.

1.14 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 MATERIALS

- .1 Hardwood lumber:
 - .1 Oak essence, with grain and color matching to the historic wood; having a humidity average content of 7 % (minimum of 5 % and maximum of 9 % for individual pieces). Grade 1, conforming to QSI Section 100.
- .2 Adhesive: Epoxy adhesive elaborated specially for repairs of wood of type required for the present project.
- .3 Wood filler: conceived for exterior use and tinted to match pour the color of existing wood.
- .4 Fasteners: stainless steel, of type and dimensions appropriate to projected use. The apparent fastening devices must have the same configuration as the existing fastening devices and the apparent part must be finished to harmonize with the existing elements.
- .5 Wood finish: Spar varnish according to prescriptions of section 09 91 13 – Painting – Exterior works.
- .6 Sodium hydroxyde Solution (NaOH) of appropriate concentration to use.
- .7 Size of granulate for jet stripping: according to SSPC-SP5

2.2 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. For doors which will be varnished, add pigments in the epoxy paste to match with the color of oak of the historic door.
 - .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. For doors which will be varnished, add pigments in the epoxy paste to match with the color of oak of the historic door.
 - .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.

Part 3 Execution

3.1 VERIFICATION OF EXISTING CONDITIONS

- .1 Stop work and report immediately to Departmental Representative conditions relevant to this contract not described in drawings: evidence of deficiencies, fungal or insect attack which may affect the scope of work and durability of the finished product.
- .2 Study carefully the brands of tools to reproduce and determine the best way to realize them.

3.2 PREPARATION WORKS

- .1 Remove all historic wood doors at the beginning of the works and for the whole duration of the works. Transport the doors in order to repair them in a heated and ventilated workshop. Leave the door frames in place and do required repairs and finishing works on construction site for the frames. Protect the historic door frames with 16 mm plywood covering on all their sides. Contractor must provide temporary insulated steel doors to replace the historic doors dismantled for the duration of the works.
- .2 Remove existing sealant around the door frame. Clean and leave work ready for application of new sealant product by section 07 92 00 –Joint sealants, and according to indications on drawings.

- .3 Remove carefully hardware pieces and metal elements embedded in doors and store them for cleaning application of new paint – except for hardware items to replace in door schedule and hardware section.
- .4 Examine doors and frames with Departmental Representative in order to determine extent of repairs by splicing to do.
- .5 Remove repair materials prior to epoxy existing in fissures at indicated places and prepare fissure for a new repair.
- .6 Strip paint and/or varnish up to bare wood without damaging surface texture by using methods acceptable to Departmental Representative. Strip existing paint on all surfaces of components of doors and frames and their transoms. Note that doors and door frames (including transom) have been covered with an anti-fungus covering after the fire which must also be stripped.
- .7 Protect adjacent surfaces to surfaces to repair to avoid damaging them during the works.

3.3 RESTORATION WORKS OF DOORS AND FRAMES WITH THEIR TRANSOMS

- .1 Do repairs to historic doors and frames and their transoms as indicated on door schedule in drawings.
- .2 Wood components and moldings of doors, of transoms and of door frames are fragile and unstable. Contractor must take all necessary precautions to avoid losing components by negligence. Contractor will be held responsible of damages caused to original wood elements.
- .3 Consolidate and nail all components and moldings weakened and unstable of historic door frames and transoms. Departmental Representative must confirm the scope of works of all frames before undertaking stripping works.
- .4 Particular techniques: study carefully tool marks to reproduce and determine the best way to realize them.
- .5 Cut back damaged or decayed wood to a point 25 mm beyond the last evidence of decay or damage. Remove decayed wood with extreme care in order to neither disrupt nor damage the adjacent surfaces
- .6 Create a cavity in existing element to insert wood repair element.
- .7 Remove decayed wood from building site daily.
- .8 Joints:
 - .1 Lay out cut joints as needed to receive the new pieces of reported wood.
 - .2 Shape repair pieces to Departmental Representative's approval.
 - .3 Trial fit joints before fastening in place. Adjust as necessary to ensure close accurate fit with adjacent surfaces
- .9 Laminated wood :
 - .1 Apply a uniform coat of adhesive on the two surfaces to join and tighten them by applying a pressure of 1000 kPa.

- .2 Avoid adhesive drippings. Remove immediately any dripping or splashing.
- .3 Remove any apparent dry and hard adhesive in finished work with methods accepted by Departmental Representative.
- .10 Fill holes of doors, frames and transoms with a filler finished flush with the surface of the wood.
- .11 Replace glass of all transoms of all historic door frames. New glass to be clear and 4 mm thick. Note that transoms have steel grilles which will be kept in place.
- .12 For the totality of doors, frames and transoms, include an extra replacement of 20% of typical components of frames (base, jamb, molding, crossbar, casson, etc...) in oak of same dimensions and same profiles as existing components.
- .13 Fill the holes and fissures of recoverable wood components with a flexible epoxy paste. Resurface deteriorated wood components according to instructions of Departmental Representative. See article 2.5.
- .14 Once components of door frames and transoms restored, have the repairs approved by Departmental Representative before proceeding to paint works.
- .15 Scrape and sand all grilles of transoms of all door frames in East Wing and two square towers. Apply a coat of epoxy based primer paint and two coats of black polyurethane based paint. Grilles are all painted in black.
- .16 Finishing of surface: finish the surfaces of new wood flush with existing surfaces and having the same texture as these and leave the surfaces ready for the new finishing by section 09 91 13 – Painting – new exterior works.

3.4 FINISHING OF DOORS, FRAMES AND TRANSOMS

- .1 The exterior side of doors/frames/transoms in oak of the north façade of the two square towers is in varnished apparent wood. See section 09 91 13 Painting – exterior works.
- .2 The interior side of oak doors/frames/transoms of the north façade of the two square towers is painted. See section 09 91 13 Painting – exterior works.
- .3 The two sides of doors/frames of the South-West tower and of the yard of East Wing (axe G) are painted. See section 09 91 13 Painting – exterior works.
- .4 Do a sanding of all surfaces and on the two sides of the doors, frames and transoms after the stripping of varnish and/or paint.

3.5 CLEANING AND REPAIRS OF HARDWARE ARTICLES TO PRESERVE

- .1 Remove hardware articles which are not identified as being to replace *au table* and in hardware section, and transport them to a workshop for cleaning and repairs.
- .2 Disassemble all riveted and bolted joints to allow the cleaning of surfaces in contact.
- .3 Remove all materials which have been added as replacement pieces in soft metal, electrical welds, bolts and similar articles.
- .4 Remove paint and corrosion in an electrolytic reduction bath of NaOH.

- .5 Do a soft and short cleaning with abrasive jet to treat any surface which has not been entirely cleaned by the electrolytic reduction process.
- .6 Make replacement pieces with the same materials used for the original pieces, including rough iron and cast iron filling rods used in materials for acetylene welding.
- .7 The electric arc weld containing nickel may only be used with prior written permission of Departmental Representative.
- .8 Remove all traces of flux, scale, oil and grease and paint the surface again according to section 09 91 13 Painting – exterior works, as follows :
 - .1 Apply primer and epoxy coating on all individual components.
 - .2 Apply two final coats of polyurethane on all sets.
 - .3 Apply polyurethane touch-ups on all connections, bolts and surfaces damaged after installation.

3.6 REINSTALLATION

- .1 Reinstall doors and their hardware at their original location.
- .2 Adjust hardware pieces for a smooth and easy functioning.

3.7 PROTECTION

- .1 Cover with waterproof tarps all finished parts of works which are not sheltered or otherwise protected.

3.8 CLEANING

- .1 Proceed to cleaning according to section 01 74 11 – cleaning.
- .2 Upon completion of works, remove from site all excess materials, tools, materials and rubbish generated during the works, to satisfaction of Departmental Representative.

END OF SECTION