

# Restoration of the Statue of Madeleine de Verchères

**PROJET 5P207-14-0904**

Parks Canada Agency  
La Mauricie and Western Quebec Field Unit

September 2014



## Table of Contents

1.	BACKGROUND.....	2
2.	DESCRIPTION OF TASKS .....	2
3.	HANDLING OF THE STATUE .....	4
4.	SPECIFIC DESCRIPTION OF THE MANDATE.....	5
5.	DELIVERABLE .....	6
6.	PAYMENT.....	6
7.	SUBMISSION OF THE SERVICE OFFER.....	6
8.	CONTENT OF THE SERVICE OFFER .....	6
9.	EVALUATION CRITERIA .....	7
10.	EVALUATION PROCEDURE: .....	7
11.	APPROVALS .....	8



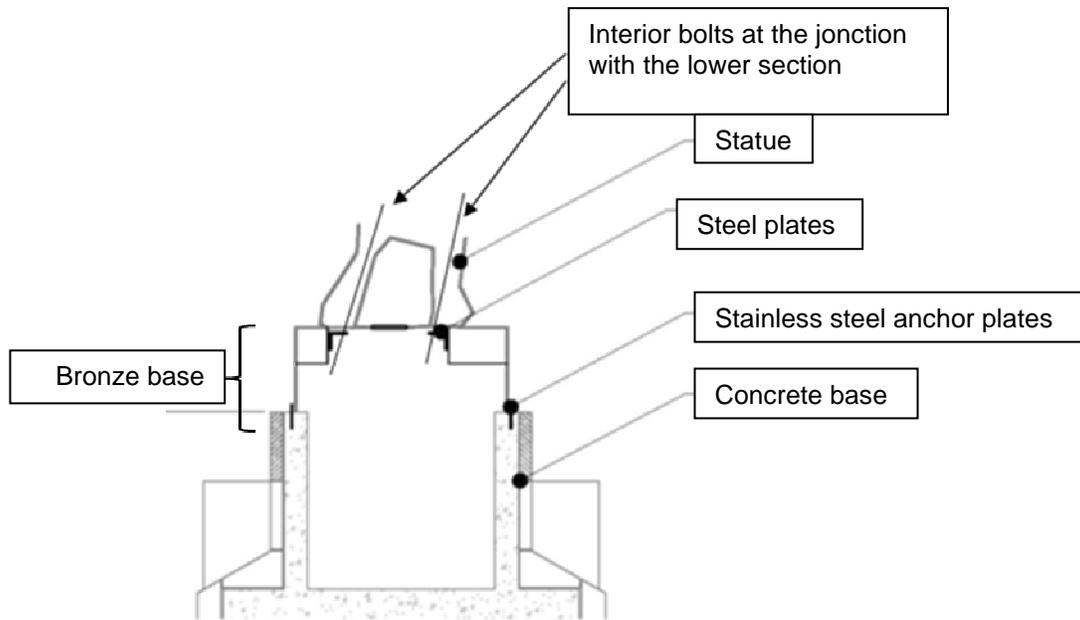
## **1. BACKGROUND**

A monument to the Canadian heroine Madeleine de Verchères was erected next to the St. Lawrence River in Verchères, near Montréal (Quebec), in 1913. The monument consists of a masonry pedestal 9.07 metres high, providing access to the monument's interior, and a large bronze statue 7.20 metres high standing on top of the pedestal. This work of art, made by the sculptor Philippe Hébert (1850-1917), is perhaps the largest bronze statue in Canada. It weighs at least 4.5 tonnes and perhaps even more than 6 tonnes.

When the masonry was repaired in summer 2013, "cracks" were noted for the first time in the lower part of the statue, in the figure's calves. A more detailed investigation revealed that the "cracks" were actually sleeve seals that had opened. Bronze sculptures of the period and of this size were often made of several components nested and fitted together with dowel pins. In fact, this was the technique used for the *Héroïne de Verchères* statue, which was cast in the Durenne foundry in Paris in 1913. The investigation also revealed certain issues relating to condensation and penetration of water inside the statue, displacement of certain dowel pins, corrosion of interior bolts between the sections of the statue and corrosion of two anchor plates.

## **2. DESCRIPTION OF TASKS**

- 2.1 Perform the necessary work on the statue to ensure its long-term preservation, structural integrity and the watertightness and stability of all of its assembly joints. The project involves the stabilization and structural reinforcement of the bronze rather than complete restoration of the statue.
- 2.2 Assume responsibility for all handling operations required to perform the necessary repair work: removing the statue from its pedestal, transporting it to the workshop, restoring it and, lastly, re-installing it on the pedestal. All of these operations must be carried out in conformity with the directives prepared by the engineer mandated by Parks Canada, as described in Section 3 "Handling of the statue". The engineer mandated by the Parks Canada Agency is responsible for the technical follow-up and supervision of the project.
- 2.3 Following the removal of the statue, open the necessary assembly joints (layers) to access the interior bolts, dowel pins, wedges, tie bolts and plates, including those located at the base of the statue (see Photo Sketch 1), in order to assess their condition and replace them, if necessary.
- 2.4 When necessary, replace interior bolts, dowel pins, wedges, tie bolts and plates between the sections of the statue with new ones in accordance with the directives of the engineer mandated by the Parks Canada Agency to ensure the technical follow-up and supervision of the project. The contractor will be in charge of making the parts in accordance with the directives of the engineer mandated by Parks Canada to ensure the technical follow-up and supervision of the project. There must not be any difference between the diameter and thread of existing wedges and those of new wedges.
- 2.5 Repair cracks in the assembly joints and other cracks to prevent water from infiltrating the statue.
- 2.6 Make drainage holes inside the statue, in places where water can remain trapped, particularly at the joints between the sections of the statue.
- 2.7 Put dowel pins projecting above the statue's surface back into their holes and replace damaged dowel pins.
- 2.8 Carry out the work needed to consolidate the statue and thus guarantee its long-term preservation and its solidity.
- 2.9 Finish and protect the metal only in places affected by the repairs.



### PHOTO SKETCH 1



Location of the main (dowelled or bolted) assembly joints



### **3. HANDLING OF THE STATUE**

#### **3.1. General:**

Within the context of restoring the bronze statue of the monument to Madeleine de Verchères, the present specifications set out certain technical aspects related to the handling and interior bolting of the bronze statue for the purpose of ensuring the statue's structural integrity on its bronze base throughout the restoration work.

The statue must be manoeuvred carefully to ensure that structural constraints are lower than half of the ultimate flexion and shear resistance throughout the statue.

The work has two components:

1. Handling the statue during its removal from the pedestal, its storage, its restoration and, lastly, its re-installation on the pedestal.
2. Replacing, if necessary, interior bolts, dowel pins, wedges, tie bolts and plates between the sections of the statue, as well as structural elements, in order to ensure the statue's structural stability.

#### **3.2. Sequence of work:**

1. Stabilize the statue with rigging or through continuous support with a crane.
2. Replace, on one bolt at a time, the corroded plates at the lower end of the bolts beneath the bronze base with two temporary "U"-shaped steel plates that can be installed without removing the existing nuts that are stuck in rust. These plates will support the bronze base when the statue is lifted during its removal from the pedestal.
3. Remove the rigging, if necessary, and place lifting slings around the statue, attaching them to the crane hook.
4. Tie a cable around each foot of the statue to guide it during removal manoeuvres.
5. Remove the eight stainless steel bolts connecting the bottom of the bronze base to the stainless steel plates set into the reinforced concrete pedestal.
6. Lift the statue and lower it onto a long-load dolly or onto supports set on the ground and made of materials that will not damage the statue's structure or surface.

#### **3.3. Procedure for handling the statue:**

A description of the procedure that is to be used for handling the statue must be submitted two weeks prior to the commencement of the work. It must be prepared, signed and sealed by a member in good standing order of the Ordre des Ingénieurs du Québec (OIQ).

It must contain a complete and detailed description of the procedure that will be used during each of the necessary handling operations, particularly, the lifting and transportation operations needed to remove the statue from its pedestal, transport, store and restore it and, lastly, re-install it on the pedestal. The lifting plan must clearly indicate, among other things, the cranes and rigging equipment that will be used and their location on the various handling sites.

#### **3.4. Bolts to be replaced at the joints between the sections of the statue:**

The new interior bolts, dowel pins, wedges, tie rods and plates must be approved by the Parks Canada Agency engineer prior to their installation.



### **3.5. Replacement of the corroded plates at the base of the statue:**

Prior to the commencement of manoeuvres to remove the statue, devices for stabilizing the bolts at the junction of the lower section of the statue with its bronze base must be supplied and installed.

Each device must consist of an assembly of two crossed steel plates measuring 305 x 254 x 20 mm, in which each plate has a slot for sliding it around the stem of the bolt and is attached to the other plate by at least two 20 mm bolts with a nut and a washer.

The two new permanent steel plates installed at the base of the statue must measure 305 x 254 x 38 mm.

### **3.6. Shop drawings:**

The manufacturer of the bolts must submit for the approval of the Parks Canada Agency engineer detailed shop drawings of the bolts, their stem and stud plates, including a description of the type of material to be used for each component.

All shop drawings must be sealed and signed by an engineer who is a member of the OIQ.

## **4. SPECIFIC DESCRIPTION OF THE MANDATE**

The successful contractor must:

- 4.1 Respect the statue's heritage and artistic integrity (**in accordance with generally accepted practices**).
- 4.2 Meet deadlines (all work must be completed and approved and the work site shut down by June 2, **2015**).
- 4.3 Coordinate work on the statue with the engineer mandated by the Parks Canada Agency to ensure the technical follow-up and supervision of the project, and with the contractor in charge of work on the pedestal.
- 4.4 See that the handling, transportation, and storage operations related to work on the statue are carried out in agreement with the engineer mandated by the Parks Canada Agency to ensure the technical follow-up and supervision of the project (see "Handling of the statue" and "Bolts to be replaced at the joints between the sections of the statue").

*Note: The contractor must ensure round-the-clock security for the statue during storage.*

- 4.5 Following an examination of the site, provide a detailed work plan, including a cost breakdown, schedules, and the restoration techniques being considered, all in compliance with the criteria set out in Section 9 of these specifications.
- 4.6 Work in compliance with the National Model Construction Codes (NBC, NFC, NPC, etc.), as well as with other applicable standards and regulations, particularly in health and safety.
- 4.7 Hold commercial general liability insurance of \$5 000 000.00 for the duration of the work, up to the final delivery.
- 4.8 Ensure the availability and supply of all materials and equipment needed to carry out this mandate within the prescribed time.



## **5. DELIVERABLE**

All work needed to ensure the long-term preservation and the solidity of the statue, as requested in the preceding sections.

## **6. PAYMENT**

Monthly progress payments will be made following the approval of the engineer mandated by the Parks Canada Agency to supervise the work.

## **7. SUBMISSION OF THE SERVICE OFFER**

The service offer must be sent by email to the following address:

Parks Canada Agency  
LA MAURICE AND WESTERN QUEBEC FIELD UNIT  
PROJECTS: MADELEINE DE VERCHÈRE  
Att: PATRICE DÉRY  
702, 5<sup>e</sup> rue  
Shawinigan, Québec  
G9N 1E9

## **8. CONTENT OF THE SERVICE OFFER**

To be considered complete and admissible, the service offer must contain the following:

### **Technical criteria**

#### **A detailed description of the proposed work and a schedule**

*Schedule (To demonstrate that the contractor will be able to complete the work before June 2, 2015, he or she must provide a schedule for the various deliverables required to carry out the project).*

Description of similar work performed within the past seven (7) years that is representative of the relevant expertise proposed. The description must include, in particular:

- A clear and concise description of the project (max. 2 pages)
- Photographs of the work.
- Budget size and management, i.e. the value of the contract carried out.
- Work schedule and whether it was met.
- Client references (name, address and telephone number of each project manager). References may be checked.



## **Financial criteria**

Financial proposal

Cost breakdown (including details for each closure joint)

## **9. EVALUATION CRITERIA**

Financial criteria: 100%

Mandatory criterion: for tenders to be considered, they must include a description of similar work carried out in the past that is representative of the contractor's expertise.

## **10. EVALUATION PROCEDURE:**

All tenders received will be evaluated on the basis of the requirements set out in the request for service offers, including the technical and financial criteria. Tenders will be evaluated by an evaluation team made up of representatives of Parks Canada.



## 11. APPROVALS

Prepared by:

  
\_\_\_\_\_  
Michel Hould

Technical Services Officer and Project Supervisor

Date: August 27, 2014

Approved by:

  
\_\_\_\_\_  
Chanhpasong Sayavongsa, Eng.

Asset Manager

Date: August 27, 2014

  
\_\_\_\_\_  
Sébastien Bachmann

Cultural Resource Management Advisor

Date: August 27, 2014