In this proposal we offer a state-of-the-art process of recreating marble sculpture, to supply a perfect replica of Lincoln's irretrievably damaged, unique, 1869 Civil War memorial sculpture.

By mold-making, reconstruction, and by utilizing the latest scanning technologies and robotic milling, we can recreate this important monument to Lincoln's soldiers, exactly as it was intended.

When we read the historic documentation looking for the artist's intent for this statue we find this passage: "…placed on the top of said monument, said statue to be made of the best quality of Carrara statuary marble…" Carrara marble is often considered the finest statuary marble, has a long history in the art of outdoor sculpture, and is only quarried from Carrara, Italy. Clearly the artist intended to use this material for the sculpture.

Thank You,

Gabriel Harrison

Proposal Summary: Historic Sculpture Reproduction

Photo documentation during the process will be given to the client, attached to a weekly progress email

Deposit 33%

Build a Plaster Reproduction of the Original Sculpture: Chicago, IL.

Estimated Completion Time: 2 months

Pack and transport original marble pieces to studio
Make molds of the original pieces: make plaster copies
Assemble copies into model; reconstruct losses and details, gun
Client approval of finished model

Payment 33%

Translate Plaster Model into Marble: Chicago, IL., Carrara Italy

Estimated Completion Time: 3 months including delivery

Digitally scan model/Create 3D CAD object: Chicago, IL.
Mill marble using CNC robotics; Drill anchor holes: QD Robotics, Italy
Delivery to Lincoln

Finish marble and Install: Lincoln, IL

Estimated Completion Time: 2 weeks

Hand finishing of details and surfaces
Install using original anchor placement

Final payment 34%

Deliverables from Project

One **marble sculpture**, exactly matching the original, installed on base
One finished **plaster model**, actual size, archival
3D digital model of the soldier statue

Total Project Cost $35,000 (including shipping, insurance, and installation)

Timeline for this sequence is estimated within 6 months from order. Price is guaranteed for start date of July 2010.
Payments will be made to “Gabriel Harrison Conservation”

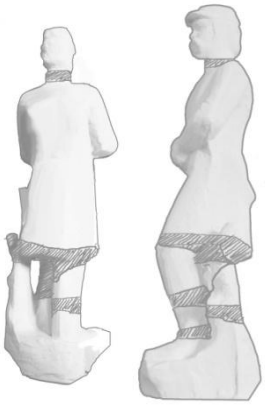
Building a Life-Sized Model from Original Fragments

Due to the weight and the fragile nature of the broken marble fragments, it is not practical to attempt to reassemble them. However we can create copies of the larger pieces by making molds of them, and casting copies in lightweight material. These copies can then be assembled to make a model, which will be a duplicate of the original sculpture.

An example of a mold and casting

Historic photographs will be helpful as a guide for the sculpting of lost detail onto the reconstructed plaster model.

Reconstruction

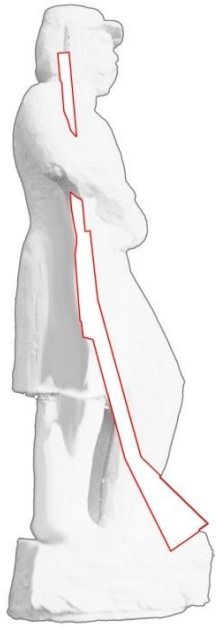


The first process in restoration of this sculpture is to construct a model. Following are the steps for creating this model:

1. Make molds of the pieces of the broken sculpture.
2. Cast the pieces in lightweight, reinforced plaster. Include anchor holes in the bottom of the base.
3. Assemble the pieces to form the statue. Plaster is added to sculpt missing sections, completing the figure.
4. Surface details and losses are sculpted onto the surface with plaster, and finished to match the original photographs.

This will give us a perfect copy of the figure in plaster. The details of the face and the clothing will be restored so that we have an accurate figure for scanning. All that is left is to re-create the gun, and then we will have a complete working model for approval.

The Rifle

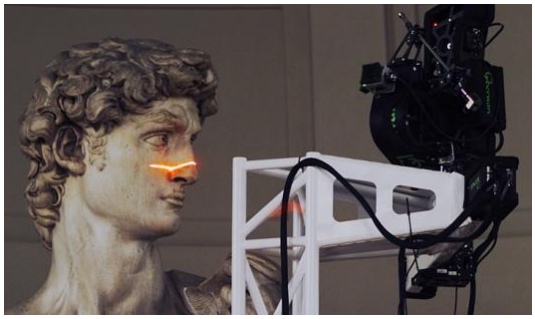


The rifle that was once part of this sculpture is completely lost.

To find an appropriate method of replacing the soldier's gun, we consider two requirements of the element. First, the gun should look like the original, accurately depicting the period rifle. Second, the element should be integrated into the form of the figure, so that it will contribute to the structure when carved in marble.

The most efficient method is to use an actual period rifle as a model, to create a properly sized copy out of wood and plaster for detail. The gun will be integrated into the plaster model composition.

Translating the Plaster Model into Marble



A team from Stanford University utilized 3D scanning technology to document Michelangelo's sculptures and architectural creations.

Digital 3D Scanning

Using state of the art three-dimensional imaging, we can capture the dimensions, surface and details of the custom built plaster model. Our model will be actual size, so there will be no scaling of dimensions, eliminating any margin of error associated with resizing the 3d model digitally.

3D scanning records the shape of objects with an accuracy which captures minute detail. We will use the same technology to record the form of the Lincoln soldier model. This data is then used as the guide for robotic milling to carve an exact marble copy.

The 3d scanner will record the shape and surface of the model.

Robot milling makes quick work of reducing a marble block into highly detailed and complex shapes, based on 3D digital matrix information.

Marble carving robot finishing a sculpture

Robotic Milling and Marble Carving

Marble carving, hammer and chisling by hand, is an excellent sculptural practice, but for contemporary restoration, we have much more accurate and non-invasive methods to carve stone. Robotic milling machines, essentially an articulating arm with a spindle grinder attached, guided by a computer "brain". These devices replicate three-dimensional computer models by removing material systematically, and without hammering, which can damage the internal matrix of the stone.

Working with a carving studio in Carrara, Italy, who operate a robot specially designed to carve marble, we can have our model translated into Carrara marble, as the artist of the original soldier, intended. When completed and hand finished, the carving will show no traces of the robotic carving method, aside from the amazing perfection in the exactness of the reproduction.

Why did this marble sculpture fall?

By Gabriel Harrison

The areas highlighted in orange are deeply decayed; the sections in blue have their surfaces intact, as they would be after 140 years of exposure. These localized patterns of decay do not suggest natural weathering.

If only to restore confidence in marble as an appropriate material for this project, we should make some sense of why the original failed. We can look at photographic evidence, and with what we know about decay in marble, formulate a likely scenario.

Outdoor marble sculptures, when not periodically cleaned, develop black stains over time. These "stains" happen on the forms, where rain water does not wash away atmospheric soiling, and eventually black crusts form. The illustration on the left shows the sections which are deeply decayed (orange), while others are much less so (blue).

The deeply decayed sections correspond with the locations where the aforementioned crusts would have formed. If these crusts had been removed with an acid, such as muriatic (hydrochloric) acid, this would explain the localized and excessive decay. It is not uncommon for this type of acid to be used in masonry. Hydrochloric acid as a solution destroys the binders of the marble, and, when dry, soluble salts become deposited within the stone, causing continual excessive decay with each re-wetting of the stone. This would explain the loss of the rifle element to decay, as well as the weakening of the proper right leg. The leg section decayed, it eventually submitted to the weight of the torso, resulting in the fallen statue.

1903 **2008**

Marble is a very durable and beautiful sculpture medium, and can retain its beauty outdoors, with a simple maintenance routine: yearly washing with water, and if needed, a non-ionic detergent. With this annual washing, stains and crusts will not be able to form, thus the idea to use improper cleaning techniques, such as aggressive acids or potentially damaging agents should never arise again.

The Longevity of Marble

To the left are current photos of two outdoor Carrara marble sculptures, each dating 140+ years; the same age as the Lincoln soldier. There are many marble sculptures from this time-period and climate which are still in excellent condition. As a testament to the longevity of marble sculpture, these sculptures require only periodic, light cleaning and to be left in their natural state to endure time.

GHC Sculpture Reconstruction and Restoration Experience: Examples

Aurora Memorial Bridge Restoration


Damaged sections were recreated with a custom mortar, matching the cement color and aggregate type to simulate the original.

Many sections of the 4 sculptures suffered losses and were in a friable state. I was able to remove loose crumbled cement, down to the sound cement below, before reconstructing the losses.

I made molds of the restored bridge sculptures on site, and cast these full size (9 foot tall) archival models of reinforced polyester resin for the City of Aurora, in case the originals eventually have to be re-cast.

Louis Sullivan Architectural Ornament Reconstruction


Destroyed by developers in the 1950's, the owners of the Carson Pirie Scott building in downtown Chicago had the decorative top floor restored in 2005, I was the sculptor leading the modeling team, and casting patterns of each of the 7 large ornamental panels for reproduction.

Each panel was sculpted by hand in oil clay, a mold was made for each, and plaster positives were finished by hand. This panel is 6 feet tall.

Gabriel worked with the restoration architects and a historian on the project, to develop an authentic "Sullivan-esque" decorative style for each of the 7 panels and 2 capitals. This project won a Landmark Award from the City of Chicago, a Devine Detail award from the AIA, and several other outstanding recognitions.

Daniel Chester French Bronze Reproduction

One of these two bronze sculptures was stolen from a Chicago Parks District park. I was in charge of sculpting a new figure of the woman in Daniel Chester French's style, as a replacement. I used historic photographs and the existing sister sculpture as guides to create the replacement figure.

The bull and base were cast directly from the sister sculpture, the figure was hand built by me, with a foam core and oil clay skin for detailing.

The new sculpture was cast in bronze and installed with its sister sculpture on their bases at the Garfield Park Conservancy, in Chicago, Illinois.

Gabriel Harrison Conservator

Sculpture conservator specializing in preservation of outdoor sculpture.

Sculpture Conservator / Restorer

2647 W. Augusta blvd

Chicago, IL 6062

(312) 342-8602

Winnetka Cenotaph: Bronze Restoration

- Dismantling decorative bronze flagpole base, approximately 50 elements removed, catalogued, conservation treatment, reassembled.
- Removing 700 lbs. sculpture from 65 foot flagpole top, conservation treatment, gilding, and reinstallation.
- Bronze elements removed, conserved, restored reinstalled: Plaques, bronze stars. Gold plating.

Conservation of Sculpture and Objects Studio

Conservator, Project Manager

Chicago, IL **1998-2008**

Supervisor of conservation practices, treatment of outdoor sculptures, completion of written and photographic documentation of conservation projects. Conservation/restoration of bronze and copper alloys, several types of ferric alloys and other metals, stone, concrete sculptures, and wooden artworks

. *Examples of restorations preformed with CSOS;*

- Laser treatment, Calder bronze figures **Philadelphia City Hall Clock-Tower**
- Laser treatment of Equestrian bronze General Wolcott for the **City of Milwaukee**, WI.
- **1890** Civil War Monument, **City of Milwaukee**, WI.
- "The Fountain Of Time", cement by Lorado Taft, Washington Park, Chicago, IL.
- "The Puritan", bronze by August Saint Gaudens, **City of Philadelphia, PA**
- "Interior Form", bronze by Henry Moore, **Art Institute, Chicago IL**
- "Dancing Figure" bronze by Robert Shapiro, **Museum of Contemporary Art, Chicago, IL**
- Conservation and installation of bronzes to the Philadelphia Zoo, and the **Philadelphia Science Museum**, Philadelphia, PA
- Stone repair of limestone relief sculptures at **Virginia Technical Institute**
- Bronze maintenance of war memorials for the **State of Maryland War Memorial Committee**, 12 plaques/statues in 1999 and 18 plaques/statues in 2001
- Cleaning and reparation of cement sculptures at the Tellen Estate for the **Koehler Foundation**, Wisconsin
- Outdoor sculpture maintenance for the **City of Chicago, IL**

Skills and duties preformed as a conservator for CSOS;

- Complete conservation of numerous outdoor bronzes, including corrosion removal, coatings, and maintenance.
- Stone conservation, including salt extraction, chemical stain removal, crack and loss repair, weatherproofing
- Documentation of conservation projects: Condition assessment, Proposal for treatment, Treatment report, Photographic documentation

Gabriel Harrison Resume Continued

Chicago Parks District

Conservation Assistant

Chicago, IL 1997

Gabriel assisted conservators in completing an all inclusive condition assessment of the Chicago Parks District collection of over 200 outdoor sculptures, including the sculptures, bases, and plazas.

- Complete restoration of a 45' cedar totem pole, gift to Chicago from British Columbia, Canada
- Complete restoration of "The Thadeus Koscusco Monument", a life-sized equestrian bronze and granite base on Solidarity Drive

Maryland Institute, College of Art

Baltimore, MD graduated 1995

BFA sculpture department. Sculptural Studies include stone, metals, and figure sculpting.

References for Gabriel Harrison, Conservator of Sculpture

"I have had the privilege of working with Gabriel Harrison during his supervision of a major conservation project on City Hall Tower in Philadelphia 2005-06… Mr. Harrison worked with and supervised a crew of technicians and conservators, developed scheduling and interfaced with City officials, a panel reviewing his progress regularly…It was a pleasure to deal with his upbeat attention to detail and execution at the best professional level."

Andrew Lins

Head of Conservation

Philadelphia Museum of Art

215-763-8100

"**I consider Mr. Harrison an expert in the field of conservation** and I give him my highest recommendation. I continue to call upon his expertise in my current position with the Port of San Diego's Public Art Program."

Yvonne Wise

Public Art Project Manager

Port of San Diego

619-400-4706

ACORD™ CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 4/6/2009

PRODUCER

Collector's Risk Inc.
456 North May Street
Chicago, IL 60642
312-829-6670

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Gabriel Harrison Consultant

2647 W. Augusta
Chicago, IL 60622

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A		GENERAL LIABILITY [X] COMMERCIAL GENERAL LIABILITY [X] CLAIMS MADE [ ] OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: [X] POLICY [ ] PRO-JECT [ ] LOC	83 SBA VX2239	4/3/09	4/3/11	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 1,000,000 $ 10,000 $ 1,000,000 $ 2,000,000 $ 2,000,000
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		EXCESS/UMBRELLA LIABILITY [ ] OCCUR [ ] CLAIMS MADE DEDUCTIBLE RETENTION $				EACH OCCURRENCE AGGREGATE	$ $
		WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? If yes, describe under SPECIAL PROVISIONS below				[ ] WC STATU-TORY LIMITS [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ $ $
		OTHER					

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