



CONDITIONS ASSESSMENT REPORT
of the
SOLDIERS AND SAILORS MONUMENT
located in
WATERTOWN, NEW YORK



Prepared for:

Michael A. Lumbis, Planner
City of Watertown Planning Office
245 Washington Street
Municipal Building Room 304
Watertown, New York 13601
mlumbis@watertown-ny.gov
Phone: 315-785-7730 / Fax: 315-782-9014

Prepared by:

Justine Posluszny Bello, Conservator
Conservation Solutions, Inc.
301-943-8249 *c*
866-843-1774 *f*
August 3, 2009

CONSERVATION SOLUTIONS, INC.

WWW.CONSERVATIONSOLUTION.COM

TABLE OF CONTENTS

TOPIC	PAGE
Introduction	p. 1
Description	p. 1
Conditions	p. 4
Discussion	p. 10
Recommendations	p. 11

CONSERVATION SOLUTIONS, INC.

WWW.CONSERVATIONSOLUTION.COM

WASHINGTON, DC METRO OFFICE • SANTA FE, NM OFFICE
MAIL: 833 EAST PALACE AVE, SANTA FE, NM 87501 EMAIL: INFO@CONSERVATIONSOLUTION.COM
VOICE: (505) 983-1950 FAX: (866)843-1774

A. INTRODUCTION

At the request of the City of Watertown, Conservation Solutions, Inc. (CSI) performed a condition assessment of the Soldiers and Sailors Monument. The assessment was performed June 29 through July 2, 2009. Assessment observations were made both from ground level as well as with the assistance of a fire truck extension ladder, provided and operated by the City of Watertown. Weather conditions at the time of the assessment were 75-80 degrees and mostly sunny, with one day of rain.

B. DESCRIPTION

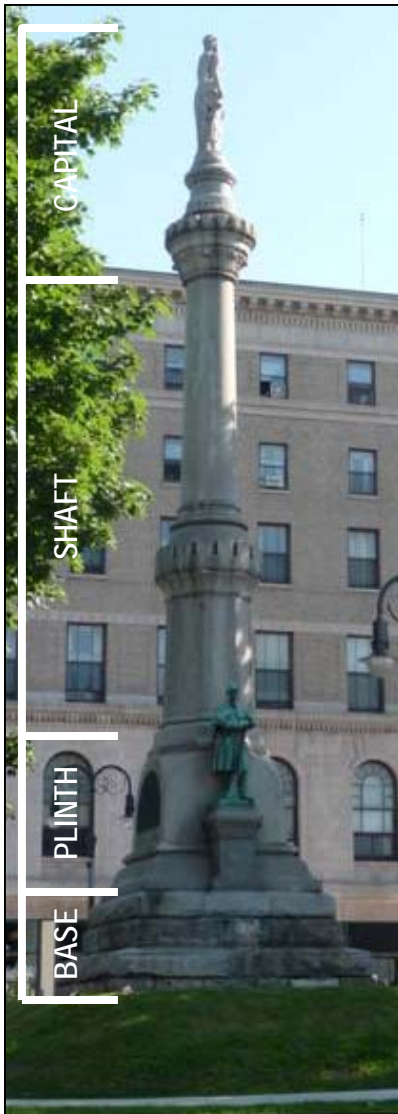


Figure 1. The north elevation of the Soldiers and Sailors monument.

Monument

The Soldiers and Sailors monument stands approximately 50 feet tall atop a berm, itself rising approximately five feet above street grade. Part of the foundation is visible, consisting of coursed rubble stone. The base is composed of three separate tiers of pitch-faced granite, each a solid slab. Atop this is a decorative plinth, consisting of a cyma and a four-sided die, six tall and wide. The cyma and die are flanked on the north and south elevations by a smaller plinth block; atop each stand the life-sized bronze sailor (north) and soldier (south). The east and west elevations of the die are each ornamented with a decorative bronze plaque. From the plinth rises an octagonal shaft, capped with a crenellated turret; this continues as an unfluted shaft, which is capped with a crenellated capital. This is surmounted by the over life-sized allegorical figure of *Victory*, facing west.

Site

The monument is situated on an oblong island known as “Public Square”, a landscaped public space at the junction of

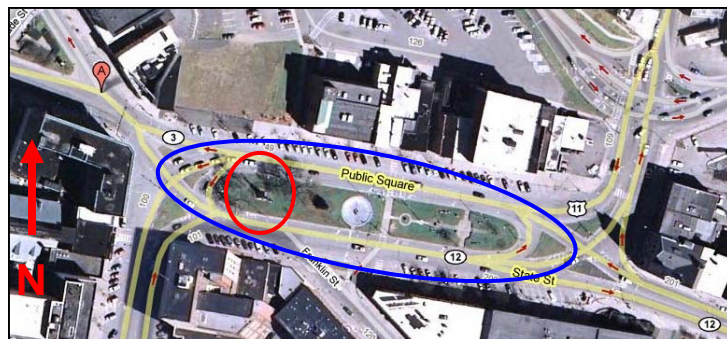


Figure 2. The location of Public Square (blue) and the Soldiers and Sailors monument (red) in Watertown.

Arsenal, State, Washington and Mill streets in the central business district of Watertown. The island is oriented on a general east-west axis; this monument stands at the far western end of the square which also includes a fountain, small pyramidal sculpture, and bandstand. The berm is encircled by a concrete sidewalk, which continues the length of the square. The monument is partially shaded by three large and one small trees, all situated approximately 50-75 feet away. No fence or other enclosure exists around the monument.

History

The Watertown Soldier and Sailors monument was one of several local memorials erected in the late nineteenth century to honor the heroic efforts of Civil War veterans. The project was initiated by Mr. George Cook, who supplied \$10,000 of start-up capital in May, 1889; the remaining funds were raised through popular subscription. Cook's efforts followed closely on the heels of his brother, Albert, who had provided funds to raise a similar monument in nearby Seneca Falls the year before. The design of the monument is attributed to sculptor Henry Augustus Lukeman and architect Edward Casey Pearce, both of New York (*Watertown Daily Times*, "First Model is Here," undated). Lukeman later became associated with monumental Stone Mountain in Georgia, while Pearce is best known as the architect of the Library of Congress in Washington, DC. The cornerstone of the Watertown monument was laid on May 30, 1890; construction was completed within a year, and the monument was dedicated at a widely-attended ceremony on June 3, 1891. The opening prayer was offered by the local Presbyterian preacher, the Rev. Allen Macy Dulles, father of John Foster Dulles (*Watertown Daily Times*, May 29, 1963).



Figure 3. Historic photograph depicting the unveiling of the monument, June 3, 1891 (image provided by the client).

Previous Treatment History

An undated article from the *Watertown Daily Times* entitled, "Soldiers' Monument Here is Nearly 50 Years Old" states that, "Now that the soldiers' monument on Public Square has been restored to its original beauty, interest has been awakened in this gift." From the stated age of the monument, the article should have been written in the late 1930s or very early 1940s. Unfortunately, no further description of the restoration that occurred at that time was provided.

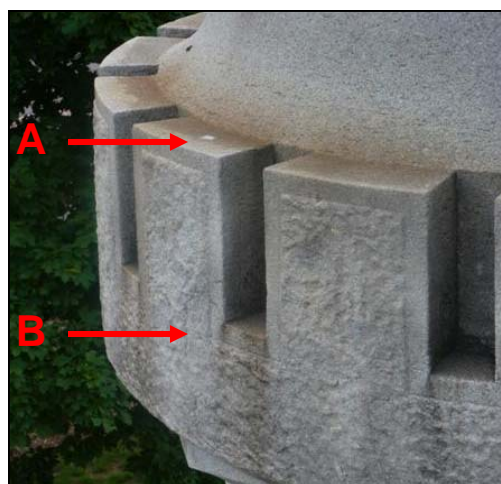


Figure 4. Example of a bush-hammered (A) versus picked finish (B) on the granite.

Materials

The monument is constructed of a fine grained gray granite, although no documentation has been located thus far to indicate the quarry. The surfaces of the base have been pitch-faced; the octagonal segment and crenellation exhibit a picked finish, and the remainder of the surfaces bush-hammered. It is laid upon a foundation of local rubble stone, minimally dressed. With the exception of the rubble foundation, all joints have been caulked with lead strips. The foundation shows evidence of several mortar campaigns. An article in the Watertown Daily Times describes that, “The monument is mounted on five feet of concrete, making it 55 feet in all above street level” (*Watertown Daily Times*, May 29, 1963). No probes were performed as part of this scope to confirm the nature of the foundation below grade.

The monument is enhanced by cast bronze figures of a soldier and sailor and two cast bronze plaques.

The inscription on the eastern plaque reads:

THIS MONUMENT, TO WITNESS
THAT THESE DEAD HAVE NOT
DIED IN VAIN AND THAT THROUGH THEM,
UNDER GOD
THIS NATION HAD A NEW BIRTH OF FREEDOM

The inscription on the western plaque reads:

MR. AND MRS. GEORGE COOK’S MEMORIAL
IN GRATEFUL MEMORY OF THE SOLDIERS AND SAILORS
OF JEFFERSON COUNTY
WHO FOUGHT OR FELL IN DEFENSE OF
THE UNION AND THE FREEDOM OF MAN

A foundry marking is located on the base of both figures, which reads:

*Built by JW Carpenter & Son
Cast by Dayton Mfg Co.*



Figure 5.
The foundry marking is legible on the base of the figure of the soldier.

C. CONDITIONS

SITE

The site is well-maintained. Public Square has always been a focal point of the city of Watertown; subsequently, its footprint, layout and contents have also continued to evolve and respond to the needs of the citizens at a given time. Anecdotal reports stated that the square was significantly refurbished recently in an effort to revitalize the downtown; renewed efforts to keep the square clean and well-manicured following this effort appear successful.

An historic photograph from the day of the monument's dedication shows that the rubble foundation course was not originally intended to be seen, but has been revealed due to soil erosion. Recent photographs supplied by the client showed a small bed of flowers encircling the base of the monument (now absent), probably an effort to partially camouflage the foundation. Landscape fabric had become partially exposed, suggesting an effort to mitigate erosion. An undated photograph, probably taken in the early twentieth century, also shows that the berm had at one time been noticeably terraced, and the site ornamented with at least one mortar and a pyramid of cannon balls. No documentation had been found to explain the removal of these elements.

The trees nearest to the monument all appear healthy and are located a safe distance from the sculpture. The lack of fencing does not appear to have engendered any sort of vandalism on or around the monument.



Figures 6 and 7. An historic photograph (left; undated) illuminates some of the changes the site has undergone over the years. [Photo care of Donna M. Dutton, *Images of America: Watertown* (Mount Pleasant, SC: Arcadia Publishing, 2001), 14.]

MONUMENT

The stonework of the monument is in fair to good condition. The massive granite blocks generally remain quite sound. The three rusticated tiers of the base as well as the octagonal segment of the plinth exhibit mild to moderate surface deterioration due to the development of microfissuring caused by the original pitch-faced dressing of these stones. These minor losses and

incipient spalls are inherent to this type of dressing and do not indicate significant deterioration or failure. Several (3-4) small cylindrical, voids were observed on the base of the monument; these are related to the mechanically techniques used to originally quarry the blocks and likewise do not represent any failure of the stone.

The southeastern corner of the cyma has cracked due to point-loading, resulting in fractured piece which remains in place. This piece, approximately 6" x 12" x 18," does not appear to be in immediate danger of falling off the monument but should be stabilized.



Figure 8. Example of voids caused during original construction.



Figure 9. Minor incipient spalls on the face of the base stones are due to the original technique used to create the pitch-faced finish of the stone.



Figure 10. Point-loading has caused one corner of the cyma level to separate at a fracture line.

Soiling of the monument is fairly mild. Black soiling has accumulated in the recesses around joints and below the crenellation, in predictable patterns indicating the path of water run-off. The greatest concentration occurs on the three rusticated tiers of the base, where atmospheric and biological soiling (both green and black) has accumulated on the undulating surfaces and along the edges of emerging flakes. Moist, green biological matter and moss are growing out of the wide, damp joints of the foundation as well as the narrow joints of the base and lower plinth. Soiling generally tends to be heavier on the north and west elevations, which receive less sun light and will stay damp longer. The figure of *Victory* exhibits bird droppings and limited yellow/orange discoloration of the stone, which may be mild rust staining.



Figures 11 and 12. Soiling and biological matter has accumulated in the recesses approaching joints (left), and in joints which remain damp.

The granite exhibits some unevenness of color, in areas such as the “backsplash” behind each of the bronze figures. The shape of a monument will necessarily encourage water to dwell longer on some areas of the stone than others; through weathering and exposure, feldspar in the granite will be converted into kaolinite (clay). The clay subsequently washes out of the stone, leaving the darker minerals present. The resulting coloration is a direct result of the stone’s morphology and should not be considered a fault or problem, nor is it a condition which can be reversed.

The sculptural aspects of the stone, including the figure of *Victory* and the foliate bands are in excellent condition. These, along with the massive stones which comprise the plinth, exhibit sharp edges, legibility and crispness of detail. Only one instance of friable stone/loss of detail was recorded, seen on a deteriorating flower on the capital.



Figures 13-15. The stone exhibits some unevenness of color due to variations in weathering (left and center), leaving some minerals more exposed (detail, right).

Joints

The joints between granite units are generally narrow, typically 1/8". It is likely that the granite blocks were dry set on lead buttons after which each joint was pointed with a lead strip. The joints are in poor condition. The existing lead is deteriorating, displaced or wholly missing from many of the joints, particularly between the second and third tiers of the base, as well as at various heights along the length of the shaft. The lead between each bronze figure and its granite plinth has also generally failed.



Figure 16. General condition of the foundation (lower course). Also note the emergence of the landscape fabric.

The joints of the rubble foundation course are wide, ranging in width from approximately 3/4" to 1 1/2." The condition of the mortar is generally poor. The joints have probably been re-pointed multiple times, with significant overruns beginning to accumulate on the adjacent stone. This is the only significant evidence of any prior treatment or intervention. Approximately one-third of the pointing mortar is missing; a significant portion of the bedding mortar has been lost as well, up to a depth of 1 to 2 inches. However, the foundation does not otherwise exhibit any signs of movement or failure.



Figures 17 and 18. Example of a typical lead strip caulk dislodged from its joint (left) and one of the many wide, open joints of the foundation (right).



Calcite Run

A significant calcite run has developed on the north side of the base, the only incidence of this phenomenon. The deposit originates from the joint between the second and third tiers of the base, immediately below the plinth of the sailor. The accretion is concentrated on the face of the second tier and the upper pitch of the lowest tier. Copper staining, atmospheric and biological soiling have become incorporated into the accretion as well. The location of the accretion indicates that as water washes through the mostly open joint it is carrying minerals along with it, which are being deposited as the water runs down the stone below. The source of the cal-

cium hydroxide that has been dissolved and deposited is not apparent as the blocks are monoliths nor is the water source obvious.



Figures 19 and 20. Overall (left) and detailed image (right) of the dense calcite run which has developed on the north elevation of the base.

Metallic Staining

Metallic staining has occurred at various locations from two sources. Copper staining has predictably occurred on the granite immediately below the bronze figures and plaques, and is visible as a light blue-green wash on the faces of the stone.

Significant iron staining was observed concentrated on the upper level of crenellation, with a lesser, minor stain visible near the foot of the sailor. Subsequent observations made from the aerial lift showed that an iron chain, approximately four feet long, is wrapped around the pedes-



Figures 21-23. Examples of copper staining (left), mild and significant rust staining (center and right, respectively) on the monument.

tal of *Victory*, resulting in the staining below. The representative of the fire department did not consider it safe to attempt to remove the chain at this time. From this vantage point, we also observed that a ferrous shim used to level the figure of the sailor is causing that stain.

BRONZE

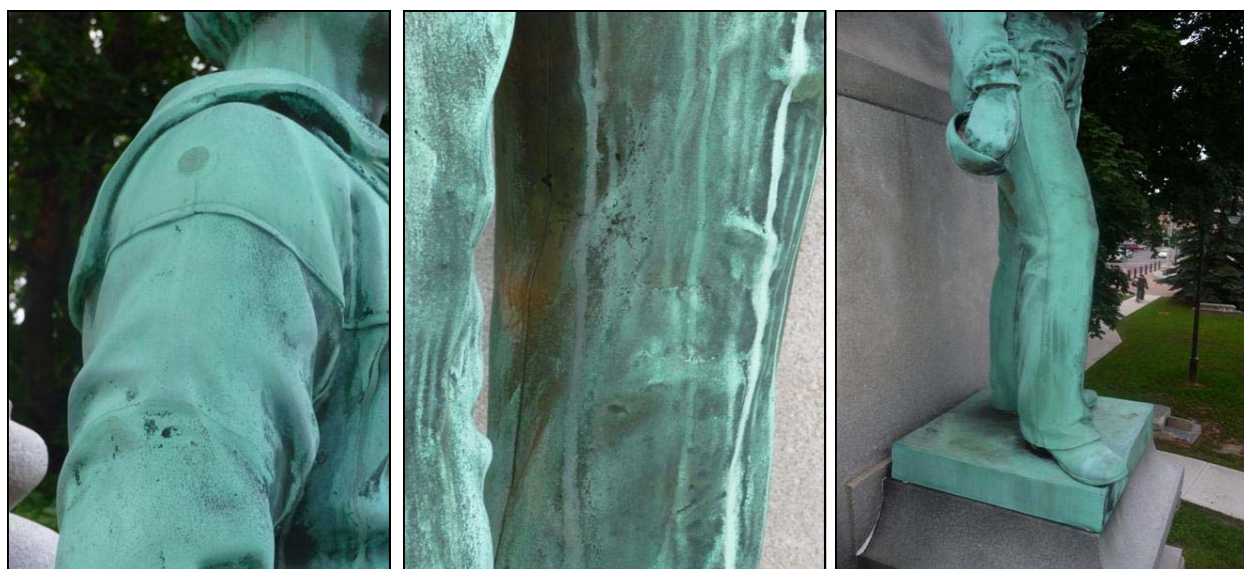
Figures (Soldier and Sailor)

Both sculptures possess an appearance and condition similar to that of other unmaintained bronzes of the same age in an outdoor environment. Active corrosion of the bronze surface is visible by its pale green appearance, streaking, and pitting of the surfaces.

The copper corrosion products consist mainly of powdery pale green deposits (most likely copper sulfates) and a hard, rough-textured crust of matte-black deposits (most likely a mixture of copper sulfides, carbon, and other airborne particulate matter). The disfiguring streaking of the surface is indicative of the paths where



Figures 24 and 25. The cast bronze soldier (left) and sailor (right).



Figures 26-28. Typical condition of bronze surface (left); typical condition of streaking and incidence of rust staining (center); missing cutlass blade (right).

water runs off the sculpture. During this process the more stable black crust is being dissolved by acidic run-off and converted into the paler green soluble sulfate form. The result is a predominantly green surface with islands of raised black crusts.

Contrary to popular belief, the corrosion layer on the surface of a bronze sculpture in an outdoor environment does not act as a protective layer. In actuality, the green and black colors that form on the surface consist of deleterious corrosion products that are both visually destructive and aesthetically unsightly. If left untreated, the relatively stable black crust found on the monument will continue to be dissolved by the acidic run-off and be converted into the paler green soluble sulfate form. In the most severe conditions, if the bronze surface is left unprotected, this situation will continue until all of the metal is converted into copper salts.

Beyond this general deterioration, the figures have sustained specific damage. The blade of the sailor's cutlass is missing, however this was the only sculptural loss observed. There are no major dents, nor corrosion fully through the metal. The legs of the sailor exhibit mild rust staining, probably due to some decoration draped on or suspended from the figure at one time. Each figure is pulling forward slightly off of its stone plinth. This is most likely due to the loosening or attenuation of the pin which holds the figure to the stone.

Plaques

The plaques exhibit surface deterioration similar to that of the figures. Both plaques possess a fairly even, dark green patina, interrupted with some light green streaks, particularly on the Cook panel; the text does, however, remain legible. No fasteners were missing, and no surface damage or loss was otherwise observed.



Figures 29 and 30. Condition of the bronze plaques, commemorating the heroism of the war dead (left) and noting the generosity of the Cooks (right).

D. DISCUSSION

The calcite run and biological soiling on the base of the granite stand out as the most anomalous among the conditions observed of the monument. Although it is clear that water is exiting the

joint at this location, the source of this water is less obvious. Because the tiers are monolithic, there are no vertical joints that could serve as possible sites of water ingress. The source of the calcite being deposited is also unclear. Normally a deposit of this type would be traceable to mortar and/or a carbonate stone itself, neither of which are seen in this situation.

It is possible that there is an internal core or doweling system through the center of the monument, such as one built of brick or concrete. This could be acting as a channel through which moisture is migrating through the monument, dissolving un-reacted lime in the core and carrying it out to be re-deposited. However, without further historic documentation or an invasive probe, this condition remains unconfirmed.

A three-foot level was laid on each tier (including those accessed by aerial lift) in at least two positions, at 90 degrees to one another. Each tier was found to be remarkably level. The monument was monitored using a transit level from four different approaches, one facing each elevation. The monument was not found to be leaning in any direction. This is a testament to the sturdy construction of the monument and soundness of the foundation, despite the failing mortar. The fracturing of the cyma due to point loading does indicate that some movement has occurred, but this does not necessarily suggest a degree of activity which should be a concern.

E. RECOMMENDATIONS

PHILOSOPHY

The goals of the recommended treatment emphasize minimal intervention by using the least aggressive means possible to achieve the most successful conservation results. To achieve such results it will be necessary to test each recommended procedure to determine which approach was most appropriate for the monument and most acceptable to the owner or the owner's representative. Therefore, although specific procedures are recommended it should be understood that they should only be instituted once the proper testing had been performed and the conservator and client have approved the results. For this reason it should be noted that although we may have recommended a specific set of treatments, the ultimate decision will be placed in the hands of the client or the client's representative.

GUIDELINES

The recommendations follow guidelines set forth in the following publications:

- United States Department of the Interior, National Park Service, "The Secretary of the Interior's Standards for the treatment of Historic Properties", Latest Edition.
- American Institute for Conservation of Historic and Artistic Works (AIC) "Code of Ethics and Guidelines for Practice," Latest Edition.

Work should only be performed or directed by Fellows or Professional Associates of the American Institute for Conservation (AIC) and who have extensive experience in the treatment of monuments and statuary bronze.

Glossary

The terms *Preservation, Rehabilitation, Restoration, Reconstruction* are used here as defined in the Secretary of the Interior's Standards for the Treatment of Historic Properties.

http://www.cr.nps.gov/local-law/arch_stnds_0.htm

The terms *Conservation, Conservator, Documentation, Stabilization* are used here as defined in the American Institute for Conservation (AIC) Definitions of Conservation Terminology

<http://aic.stanford.edu/geninfo/defin.html>

Other historic preservation terms are used here as defined in the ICOMOS Heritage Conservation Terminology and Definition of Terms

http://www.icomos.org/~fleblanc/publications/pub_terminology_e.html

Architectural descriptions are used here as defined in the Getty Art & Architecture Thesaurus On Line

http://www.getty.edu/research/conducting_research/vocabularies/aat/

Material names are used here as defined in the Conservation and Art Material Encyclopedia Online (CAMEO)

<http://www.mfa.org/cameo/frontend/home.asp>

ACCESS

Several decks of scaffolding should be erected from the ground and/or berm to provide access to most labor intensive areas of the monument, namely the base and lower plinth. An articulating boom lift should provide adequate access for the remainder of the work to be performed above this level. The lift should only be operated by a trained operator wearing proper personal protective equipment, and all weight restrictions--taking into account the added weight of tools and materials in the lift--should be strictly obeyed at all times.

MASONRY TREATMENT

Cleaning Using Triton X-100

All granite surfaces should be cleaned with an anionic detergent. Triton X-100 should be diluted 1 part concentrate to 100 parts water. Areas of soiling should be further washed with detergent using gentle scrubbing with soft brushes followed by water rinses.

Application of D/2 Architectural Anti-Microbial

D/2 Architectural Anti-Microbial, or approved equal, should be used to removed biological

soiling. Concentration will be determined through testing. Areas of biological growth will be removed using gentle scrubbing with soft brushes followed by water rinses.

Metallic Stain Removal

Metallic stains should be addressed locally using stain-specific treatments. Exact methods should be developed through initial cleaning tests.

Following detergent cleaning, copper stains should be removed by poultice cleaning using ammonium citrate in attapulgite clay. The stone surrounding the stain should be masked with blue tape and/or plastic sheeting. The chemical will be mixed with powdered clay until a workable paste consistency is achieved, and applied to the stain in an even thickness using plastic trowels. Areas will be shaded as needed to avoid uneven drying; the poultice will be monitored, and adjacent areas may be misted to force evaporation away from them and to the poultice.

When the clay has dried sufficiently, it should be scraped off the surface with plastic scrapers, contained, and disposed of accordingly. Residual clay will be dry-brushed from the surface and then thoroughly rinsed with pressurized water. The stone should be allowed to dry and reassessed, and the process repeated as needed. Removal of embedded copper stains should only be performed by highly experienced conservators, as improper poulticing risks leaving even more unsightly turquoise blue stains.

Iron stains should be removed using a solution of Iron Out or approved equal. A dilute solution will be applied following the manufacturer's recommended procedures to the pre-wetted stone surfaces. Adjacent surfaces should be protected during treatment. The solution should remain on the surface for the appropriate dwell time, to be determined through initial cleaning tests, after which the area should be thoroughly rinsed. The process may be repeated as needed on particularly tenacious stains.

Masonry Repairs

The fractured corner of the cyma should be reset and the joints sealed to prevent further water ingress. The minor cylindrical voids should also be filled with an appropriate patching mortar to prevent unnecessary water ingress.

As minor incipient spalls on the rusticated surfaces of the base are inherent to this type of dressing and do not indicate significant deterioration or failure, these fragments do not require stabilization or reapplication.

The calcite run should most likely be eliminated through careful mechanical removal, using a variety of hand and powered Dremel tools. Extreme care will be taken to avoid scarring underlying surfaces. Mechanical cleaning may be followed by micro-abrasion (JOS Cleaning) as needed to remove remaining scale and blend the edges of the cleaning site. Alternatively, the

deposit may be dissolved using nitric acid, a solution which will not react with the granite substrate.

Repair of Mortar Joints

All existing pointing mortar, including inappropriate overruns, should be carefully removed using hand tools. To ensure the deepest recesses of the rubble course are well-bonded and stable, these joints should be filled using an injection grout. The faces of the joint should be partially dammed with an appropriate mortar. A low-viscosity grout should then be injected behind the dam to flow through the foundation, filling openings between stone units which would have otherwise been inaccessible. The injection ports should then be pointed to match the surrounding mortar.

As part of the work necessary to identify an appropriate mortar, we recommend that wet chemical analysis be performed on a mortar sample, as this investigation was not undertaken as part of the scope of the assessment.

Repair of Lead Joints

Repairs should be made as needed to ensure all joints are properly sealed with lead. Properly sealing the joints, particularly those near the top of the monument, should discourage future moisture infiltration and the recurrence of significant biological growth or a calcite run on the base. Dislodged lead strips should be tamped back into place. Lead that is severely damaged should be removed; these and otherwise open joints will be fitted with new lead cut to the appropriate thickness and length.

BRONZE TREATMENT

Recreation of Missing Bronze Casting (Sailor's Cutlass Blade)

As part of this treatment, the sailor's missing cutlass blade should be recreated. A new model should be made based upon detailed historic photographs (if available) or one of a number of well-documented Civil War era examples, to be approved by the client. A mold should be made of the sailor's hand and the extant hilt of the cutlass to ensure that the replacement will match the profile of what exists. A new model should be created in wood, wax and/or plaster. The model should be cast by a foundry experienced with bronze statuary restoration. The new casting should be attached to figure using bronze threaded rod; all rods and joints should then be welded to firmly affix the new casting to the figure. The entire element should then be patinated to blend in with the approved patination scheme of the sailor and waxed in the same



Figure 31. Example of naval cutlass circa 1860, a likely example to serve as a model for recasting.

manner as the other bronze elements.

Cleaning Using Orvus

All bronze surfaces should be cleaned with an anionic detergent. Orvus WA Paste should be diluted 2-5% with clean water. Areas of soiling should be washed with additional detergent, scrubbed gently with soft brushes and rinsed with pressurized water (600-800 psi).

Following general cleaning, loose corrosion products should be removed from all bronze surfaces using low to medium pressurized water (2000-2500) using a 15° fan tip. Consistent tip-to-surface distance, angle and dwell time should be maintained throughout cleaning. The surfaces should be continually monitored to ensure that no bare bronze is being exposed. Remnants of previous coatings should be removed locally as needed using solvent gels and hot water or steam.

Lead Joint Repair

The open joints between each bronze figure and its granite plinth should also be recaulked with new lead strip caps.

Patination

Depending upon the results achieved from the water jetting, the sculptures and plaques should then be patinated to help reduce the contrast between the areas of light green corrosion and the black sections. The desired result should be developed in consultation with the client, within the parameters of the existing patina and what can be achieved using typical hot and cold patination techniques.

Application of Protective Wax Coatings

Following patination, the sculptures and plaques should receive a protective barrier coating of wax. The sculptures will be heated with a propane torch; two coats of new wax (National Parks Service formula) should be applied to the fully cleaned sculpture. Care should be taken not to direct the flame at the surrounding stone or to overheat the metal, particularly when treating the plaques. After the sculpture has cooled, a sacrificial top coat of Butcher's Bowling Alley cold paste wax should be applied to all bronze surfaces, allowed to dry and thoroughly buffed to a polish.

DOCUMENTATION TO AIC STANDARDS

All work should be thoroughly documented in written and photographic form. Overall and detailed images of each treatment item and phase should be taken in digital format. A treatment report should be provided upon completion of the project with guidelines for future maintenance.