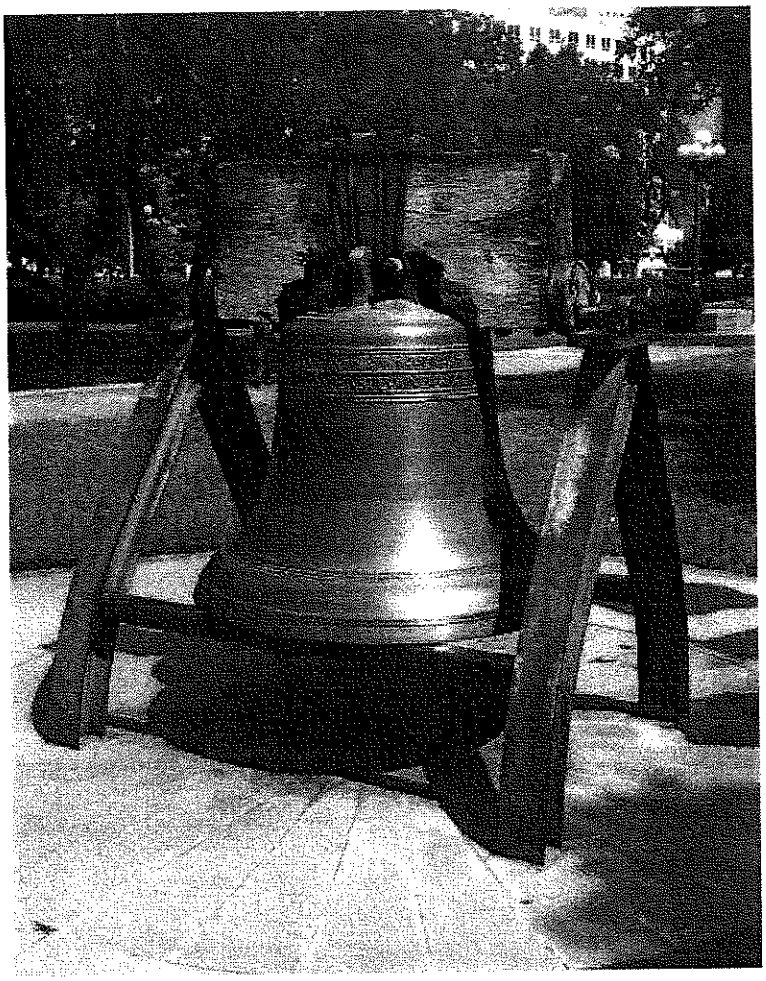
DRAFT
TREATMENT PROPOSAL
Denver's Liberty Bell replica



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I. PROJECT DESCRIPTION

A. CLIENT INFORMATION

OWNER State of Colorado

AUTHORIZED AGENT Sue Johnson, Chairman Historical Preservation
Mount Rosa Daughters of American Revolution

ADDRESS

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EMAIL suejohnsonskj@comcast.net

B. OBJECT INFORMATION

OBJECT: Liberty Bell replica

ARTIST: Paccard Foundry in Annecy-le-Vieux, France.

DATE: 1950

LOCATION: Lower Capitol Lawn in Lincoln Park, Denver, Colorado

MATERIALS: Cast bronze bell, steel bent I-beam frame and attaching bolts, wooden yoke, concrete base.

C. CLIENT'S EXPECTATIONS

This treatment proposal is intended to address the preservation of the surface of the bronze bell, its supporting wooden yoke, steel frame, attaching hardware, clapper and supporting concrete.

- Restore the appearance of the Liberty Bell replica to the quality it deserves.
- Increase the visibility of the Bell for the citizens of Colorado and tourists.
- Replace or repair any elements in its design that are structurally unsound or cosmetically unsightly.
- Incorporate materials in the restoration process that can withstand the Colorado climate and provide longer term solutions for erosion.
- Replace plaques of acknowledgement or dedication that are currently missing.
- Encourage proper future maintenance of the Bell by the proper organization(s).

II. CONDITION REPORT

A. FABRICATION TECHNIQUES

This Liberty Bell replica is a traditional cast bronze piece, attached to a wooden yoke with iron hardware. This bell assembly is mounted on a steel "I" beam frame by through-supporting bearings. The supporting frame is mounted in concrete into which have been set bronze dedicatory plaques. Additional support for the bell has been added between the two supporting frames and under the bell. The clapper appears to have been welded onto one of these additional support elements.

B. STRUCTURAL CONDITION

The structure of the bell itself is in excellent condition. The attachments of the bell to the yoke also seems secure. The wood of the yoke shows substantial aging and deterioration, but may have substantial strength remaining. The connection of the yoke to the bearings is more problematic. The axles have shifted out of alignment, causing the bell to sag, which most likely was the cause for the installation of additional support below the bell. Some of this sagging may be caused by deterioration of the wood, but it also may be because of inadequate support for the axles in the wood and at the bearings. The support frames, as well as the concrete, appear to be structurally sound but showing signs of age. Some of the dedicatory plaques have been removed leaving the concrete scarred with old mounting holes. The welds of the additional support elements under the bell have begun to fail, as evidenced by cracks in the welds. The attachment of the clapper to the ball appears sound.

C. SURFACE CONDITION

The surface of the bell is in very good condition exhibiting little of the deterioration typical of bronze in the outdoor environment, such as blue-green corrosion products. All of the iron elements exhibit some light surface corrosion. The wood of the yoke has greyed, checked and eroded in places and may show some decay on the upper surface. The surface of the concrete has aged with minor losses along some of the incised edges, with shallow cracking in places and some areas of surface loss.

III. PROPOSED TREATMENT

A. TREATMENT SUMMARY

The Denver Liberty Bell replica could be treated in situ or offsite, depending on the overall approved treatment and the decision on concrete replacement. Treatment of the concrete is beyond the scope of this proposal; however, the decision on how to treat the concrete will have an effect on the overall treatment of the bell and support assembly. The bell will be washed and a reversible, maintainable hot wax protective coating applied. All of the mounting hardware attached to the yoke will be removed and individually treated to insure its stability. The wood of the yoke will be evaluated to determine if it needs to be replaced or if it retains sufficient strength to support the bell. If necessary a new yoke will be cut, using appropriate wood species such as black locust, following the pattern of the existing original. The bearing system will be evaluated. The supporting axis may be machined or refabricated, and additional bearings added to provide

additional support through the axles. The support frame will be cleaned and coated with a modern silica-based paint to provide a durable finish with a long service life. A system will be developed which allows the bell to be rung on occasion. This system will be designed with a locking mechanism to prevent unauthorized use. Additional support under the bell will be considered. A Maintenance Plan will be provided, including recommendations for ongoing maintenance.

B. RECOMMENDED TREATMENT

1. Concrete

It is the opinion of this conservator that the existing concrete may give many more years of service before needing to be replaced. Minor concrete repairs may be needed. Repair and/or replacement of the concrete are beyond the scope of this proposal. If the concrete is to be replaced, the deinstallation and reinstallation of the bell, along with its moving, storage, and security, are also beyond the scope of this proposal.

2. Bell

The bell will be cleaned with water and a mild nonionic surfactant to remove dirt, grime, pollution or other residues. Two coats of a reversible sculpture wax will be applied to the surface of the bronze sculptures. The first will be applied by a technique known as hot wax. The bronze elements of the bell will be warmed to the melting temperature of the wax system, using a propane torch. The wax will be brush-applied to all surfaces of the bronze bell and leveled using a propane torch. The wax which will be used is a formulation developed specifically to be used in sculpture conservation. After the bell has completely cooled, a second layer of cold paste wax (same mixture) will be applied to the surface. This layer will be bonded with the first layer and flame-polished with a little heat from the propane torch. The final appearance of the bell will be that of an aged but cared-for bronze. The surface will be semi-gloss in appearance. The overall appearance and legibility of the bell will be improved to more closely approximate the original intent, without completely eliminating the appearance of natural aging.

3. Yoke

The wood of the yoke will be evaluated to determine if it has sufficient strength to be reused. If not, a new yoke will be cut. Retaining and strengthening the yoke is in keeping with the ideals of conservation rather than restoration. The appearance of the aged wood is in keeping with overall appearance of this historic artifact. Appropriate consolidants will be considered. If the yoke is retained, it may be treated with a borate compound (Boro-care; reference at http://nisuscorp.com/builders/products/bora-care) to prevent biological and insect attack on the wood. Approval for the use of this product will be obtained before application. A maintenance coating of water repellent will then be applied.

If a new yoke is to be produced, it may be a challenge to find a large enough piece of dry wood of an appropriate species. It may be necessary to use a green piece of wood, if dry is unobtainable. The most appropriate native wood with regard to rot resistance is black locust. Non-native species such as purpleheart most likely would be obtainable in dry appropriate sizes, but this a tropical hardwood. The existing yoke was hand-axe hewed as is evidenced by tool marks. It would be important to reproduce this appearance, rather than leaving the finish with

circular saw or planed marks. The new yoke would be cut by a shipwright with experience of hand hewing timbers of this size. The timber will be adzed rather than axe cut. The surface of the new wood will be treated with potassium permanganate to aid in the greying of the wood.

NOTE: It is the opinion of this conservator that if the old yoke can be safely used, it should be. The mounting bracket can be made to support the weight of the bell. Restructuring of the iron elements will prevent sagging of the axils, which will transfer loads from the wood to the iron elements. A potential compromise might be to stabilize and reuse the existing yoke for a number of years while several green pieces of native rot resistant Black Locust are dried to be cut into a new yoke in the future.

4. Mounting Hardware and Support Frame Coating

The iron elements of bell assembly will be disassembled for treatment. These metal parts will be treated to remove corrosion products. They will be primed with an appropriate epoxy primer (such as Ameron, Amerecoat 68HS or similar) depending on the degree of preparation achieve on the metal surface. They will be painted with a silica based paint (such as Ameron, PX 700). (These maintenance coatings are intended for long-term durability, that is easily re-treatable. This is the same paint that is being used by the U. S. Navy and on bridges where a 30-year service life is expected. Retreatment is repainting with another long-service life paint.) The threads of the bolts will be painted after everything is re-assembled.

5. Bearing support

A historic structures engineer will be consulted about the stabilization of the pivots and of the yoke assembly. While the axles are disassembled they will be machined or refabricated to rotate on a pair of bearings on each side. The new bearings will match the old ones, insuring that the axle remains horizontal under the load of the bell. This added stability will work in conjunction with some re-engineering of the bolts in the yoke. It appears that all the bolts that hold the axle in place are in tension when the nuts are tightened. There needs to be a balance between bolts in compression and others in tension to prevent the axle from sagging. This can be achieved by adding some additional nuts. With these minor alterations, the iron elements work more effectively with the yoke to keep the axles horizontal under the load of the bell.

6. Mount design

In coordination with, and approved by the client, a mount will be designed for a mechanism to prevent the bell from swinging and to lock the clapper in place. They will be designed so that they can be removed to allow the bell to be rung on occasion. Because this bell does not have a mechanism to make the bell swing, it is recommended that the bell be rung using a rope tied to the clapper. The mechanism that keeps the bell from swinging may have to be removed to insure that the bell rings with a clear tone.

7. Plaques

The missing plaques will be recast in bronze based on camera-ready designs supplied by the client. The background color will be chosen to be compatible with the remaining plaque's appearance. They will be mounted using stainless steel studs in an appropriate permanent adhesive.

8. Maintenance program

A maintenance program will be delivered in conjunction with the final report.

a. The Bell will need to be washed and waxed once or preferably twice a year by trained volunteers.

b. Paint coatings are intended for a 30-year service life and can otherwise be touched up as needed with appropriate paint. Retreatment in 30 years is to repaint with another appropriate paint.

c. It is intended that the yoke be made of the most decay-resistant wood available for a long service life. Water repellants or wood preservatives may be needed in later life, but is not expected.

V. COMPANY POLICIES

A. STANDARDS

All work will conform to the code of ethics and standards of practice of The International Institute for Conservation of Historic & Artistic Works (I.I.C.) and The American Institute for Conservation of Historic and Artistic Works (A.I.C.).

B. DOCUMENTATION

In keeping with both the international and national standards of practice, both written and photographic documentation will be undertaken. Before, during and after photographs will be taken. A treatment report and maintenance recommendations will be written, to be included with the attached condition report in a final report. This final documentation will be submitted to the client within a reasonable amount of time after the treatment is completed.

C. QUALIFICATIONS OF WORKERS

1. Conservator: Jonathan Taggart

Jonathan Taggart has a Master of Science degree in Art Conservation. He will be the primary person involved in the treatment. All standards, materials, techniques and workmanship will be directed by him. He will be present or available at all times when work is in progress. He has many years' experience as an objects conservator, and with artistic and architectural monuments.

2. Technicians

Other conservators or technicians may be employed as independent contractors to assist the conservator in set-up of equipment, handling of material, daytime site security and as needed in preparation, break-down and in the process of the treatment. The technicians will be skilled in the use of tools and will have some conservation experience.

D. BUSINESS POLICIES

It is the policy of Taggart Objects Conservation to work cooperatively with the client to preserve our cultural patrimony. This proposal includes an estimate of the cost to complete the proposed work described above. The estimated costs of this proposal are based on estimated time charged at the rate of $125 per hour and estimated costs of materials and expenses. Additional costs of changes approved by the client, made after the contract, will be charged at the rate of $125 per hour and actual expenses.

E. CONTRACT CONDITIONS

1. The Client will provide power and water to the site when it is available.
2. The Owner/Authorized Agent agrees that he/she is the owner or the authorized agent of the owner of the work(s) of art.
3. All conservation work will be performed consistent with the Code of Ethics and Guidelines for Practice set forth by the American Institute for Conservation of Historic & Artistic Works.
4. A service charge of 1.5% or $50 per month, whichever is greater, will be made on charges not paid within 30 days after notice of completion of services performed in the signed agreement.
5. The Owner / Authorized Agent agrees that Taggart Objects Conservation may use photographs, drawings and written documents made in the performance of the proposed services for educational purposes.

VI. COST ESTIMATES

Mobilization and demobilization	$800	
Insurance	$100	
Airfare	$800	
Hotels, 13 days, @ $141 /room/day GSA rate	$1,833	
Per diem for 14 days, @ $66/day	$924	
Work vehicle rental, 2 weeks	$900	
Mileage, round trip to airport; 90 mi. @ $0.51/ mi.	$46	
Travel time @ half rate, 20 hrs. @ $62.50 / hr.	$1,250	
TRAVEL SUB TOTAL	$6,553	
Proposal, report and documentation	$2,000	
Bell cleaning and application of protective coating	$3,000	
Fabrication of yoke	$2,500	
Wood	$1,000	
Shipping	$500	
Site fencing and lifting equipment	$1,700	
Scaffold, tenting	$700	
Historic structures engineering	$3,000	
Disassembly, cleaning, coating and assembly	$12,000	
Mount design, fabrication and installation	$3,000	
Equipment: pressure washer, welder, air abrasive equip.	$2,000	
SUB TOTAL	$31,400	$37,953

Concrete work is not included.

VIII. AUTHORIZATION

This section serves as an authorization for all of the proposed treatments for the various monuments listed in this document.

It is understood that a treatment may be halted or modified should new problems or concerns arise from the parties involved in this contract. After consultation with the Owner or Authorized Agent, a new estimate may be given if the problems are more complex and the treatment more time-consuming than originally estimated.

In accordance with these listed contract conditions, the above proposals are accepted and the Conservator is authorized to carry out the proposed treatments.

Submitted by _____ Date_____
Jonathan Taggart

Approved by _____ Date_____

This cost estimate is valid until the end of the year 2013.