

**ARLINGTON NATIONAL CEMETERY
TOMB OF THE UNKNOWN MONUMENT
REPAIR OR REPLACEMENT PROJECT
JUNE 1, 2006
DRAFT**

I. Introduction and Purpose

This paper provides a summary of the proposed undertaking at Arlington National Cemetery in Arlington, Virginia, regarding the possible repair or replacement of portions of the Tomb of the Unknowns (also known as the Tomb of the Unknown Soldiers) Monument (Tomb Monument). The Tomb Monument, as referred to in this paper, is the four-piece marble object located over the vault containing the remains of the World War I Unknown. Cracking and erosion of the Tomb Monument has led Arlington National Cemetery to consider the repair or replacement of three parts of the Tomb Monument.

II. History of the Tomb of the Unknowns Monument

The original grounds of Arlington, including the project area, were once the home of George Washington Parke Custis, having been purchased by his father in 1778. Custis moved to the property in 1802, and immediately started improvements on the land, including the construction of the Greek Revival Arlington House. The house was completed in 1818. Upon Custis' death in 1857, the Arlington estate was inherited by his daughter, Mary Custis Lee, wife of Lt. Colonel Robert E. Lee. The Lees departed Arlington in 1861, at the onset of the Civil War, and the estate was confiscated by the U.S. Government and occupied by Union troops.

To accommodate the burial of increasing numbers of Civil War dead in the Washington area, Arlington National Cemetery was established in May of 1864, by order of President Lincoln's Secretary of War, Edwin M. Stanton. Arlington House and its surrounding 200 acres were designated for use as a military cemetery and became a National Cemetery at that time. By year's end, over 7,000 Union soldiers were buried at the cemetery. Arlington National Cemetery has continued to honor the men and women who have served in the United States Armed Forces from that date to today.

Construction of the Memorial Amphitheatre

The early history of Arlington National Cemetery was primarily focused on areas surrounding the Lee Mansion. Here were the cemetery's first interments, the Civil War Unknown's memorial, and the original amphitheater (now referred to as the "Old Amphitheater"). The first Memorial Day (then known as "Decoration Day") took place on May 30, 1868, and attracted a number of visitors to Arlington. By the time Decoration Day was renamed and made a national holiday in 1888, Arlington National Cemetery was well on its way to becoming a prominent location for services honoring the nations' war

dead. Within 40 years of its founding, Arlington National Cemetery was recognized as a national shrine (Peters 1986).

Overcrowding in the Old Amphitheater caused the Grand Army of the Republic, a Union veterans' group, to push for the construction of a new amphitheater. By Act of Congress on May 30, 1908, a commission was formed to plan and construct a new amphitheater, although funding for construction of the Memorial Amphitheater was not provided until 1913.

Designed by architect Frederick D. Owens of the New York firm of Carrere and Hastings, the Memorial Amphitheater is a combination of Greek and Roman design, melded with the Colonial style of other Washington edifices (Peters 1986). The Memorial Amphitheater was dedicated on May 15, 1920. With its opening, the focus of the cemetery shifted to that location.

Design and Construction of the Tomb of the Unknowns

The First World War ended on the 11 of November, 1918. Two years later to the day, the French government buried an unknown soldier from the conflict in the Arc de Triomphe, and a British unknown was buried in Westminster Abbey. The following year, the Italian government interred an unknown in front of the monument to Victor Emmanuel in Rome.

Following the example of our allies and in response to public sentiment, the U.S. Congress approved a resolution for the interment of an unknown American soldier at Arlington National Cemetery, to take place on the following Armistice Day. The bill was introduced by Congressman Hamilton Fish of New York. On March 4, 1921, on his last day in office, President Woodrow Wilson signed the bill into law. The bill, Public Resolution (PR) 67 of the 66th Congress, also called for construction of a tomb for the unknown. As envisioned at that time, the tomb would consist of a simple base upon which an appropriate monument would later be erected (Quartermaster Review 1963 [1958]).

While the elaborate process of selecting a World War I unknown soldier was taking place in France, a white marble tomb was constructed on the east plaza of the Memorial Amphitheater. The tomb consisted of a subterranean vault surmounted by a marble plinth and base. The vault and monument foundation are made of concrete and have been described as "massive" (Oehrlein 1990). The footings measure 16 feet 2 inches by 9 feet 6 inches, and extend to a depth of 20 feet. The vault walls and cover range from 2 feet 4 inches to 7 feet thick. The tomb, constructed above the vault and set into the steps on the east side of the plaza, contained a rectangular plinth (or sub-base) surmounted by a slightly smaller base (Figure 1). On top of the base was a rectangular capstone with curved sides. The grave shaft leading to the vault opened through the center of the plinth, base, and capstone. The World War I unknown was interred as scheduled on November 11, 1921, on top of a two-inch layer of soil from the battlefields of France that had been placed in the bottom of the vault. Shortly thereafter, the opening of the grave shaft was covered with a marble lid.



Figure 1: Original Tomb Monument ca. 1927

Congress did not authorize completion of the monument until July 1926, when they appropriated \$50,000 to complete the endeavor (Quartermaster Review 1963 [1958]). PR 67 authorized the Secretary of War to secure competitive designs for the monument that was to sit atop the existing base. The designs were to be approved by the Arlington Cemetery Commission, the American Battle Monuments Commission, and the Commission of Fine Arts. Architects with both a “standing reputation” and American citizenship were invited to compete (United States Army [US Army] 2006). Seventy four designs were submitted, from which five were selected for additional review. The five selected competitors were required to restudy their proposals and provide plaster-of-paris scale models of their work. The five designs were reviewed by a jury, who considered the effects of the proposed monuments on the Memorial Amphitheater and its surroundings. The jury included Mr. Charles A Coolidge, F.A.I.A., Chairman; Mr. Paul P. Cret, a prominent architect and a member of the American Institute of Architects; the Honorable Hanford MacNider, former Assistant Secretary for War; Mrs. William D. Rock, representing the American War Mothers; and, Mr. Victor Mindeleff, Architectural Advisor (US Army 2006). After careful deliberation, the jury selected the design of Lorimer Rich, architect, and Thomas Hudson Jones, sculptor, of New York City.

The winning design was in the form of a “sarcophagus,” although unlike a true sarcophagus, it was not designed to contain human remains. The design was austere but impressive (Rich and Jones 1929). The monument would be composed of three pieces: the base, the die block (the largest, middle piece), and the capstone. The die block had Doric Pilasters in low relief at the corners and along the sides. On the west elevation, facing Washington and the Potomac River, was a sculpture of three figures. In the center of this panel stands "Victory;" on her left is a male figure symbolizing "Valor," and on the right stands "Peace." The north and south sides were divided by fluted Doric pilasters

into three panels, each containing a carved, inverted wreath in the upper portion of the panel.

On the west elevation appeared the Tomb's only inscription: "Here Rests In Honored Glory An American Soldier Known But To God." The author of this moving phrase is unknown, but it did not originate with the Tomb Monument. The phrase had been used on crosses marking World War I unknowns in European cemeteries as early as 1925 (Quartermaster Review 1964).

In order to provide a more appropriate setting for the new monument, the Rich/Jones final design for the Tomb Monument was expanded to include improved landscaping and approaches to the Tomb. On February 29, 1929, Congress authorized funding to construct an elaborate eastern approach to the Tomb. The large, arched retaining wall forming the east end of the plaza was removed and replaced with a massive flight of steps. A new landscaping design was installed to the east of the steps, extending to the east side of Roosevelt Drive. After securing additional Congressional funding, a contract to complete the Tomb Monument was awarded on December 21, 1929.

Construction of the Tomb Monument was under the direction of the Construction Division of the Office of the Quartermaster General, Brig. General Louis H. Bash. The Hegman and Harris Company of New York City was the general contractor. The Vermont Marble Company was sub-contracted to obtain the required three pieces of marble that would form the new monument, which they quarried from the Yule Marble Quarry at Marble, Colorado. Problems obtaining the appropriate pieces of marble were encountered immediately, and it took an entire year before the quarrying was completed (Neil 1932). Three enormous pieces of marble were quarried before a suitable die block was obtained (Figure 3). The 18-ton base proved even more troublesome. Three attempts were made before an acceptable piece was recovered. Unfortunately, it was not until the base's actual arrival at Arlington that an imperfection was detected, necessitating a return to the Yule Quarry for a replacement (Neil 1932). After three more attempts, what is now the existing base of the Tomb Monument was obtained. Not all the quarrying went poorly- a perfect, 14-ton capstone was procured on the first try.



Figure 3: The Die Block in Marble, Colorado; March 1931

After being rough-cut at the quarry, the marble for the Tomb Monument was shipped by rail from Colorado to Rutland, Vermont, where it was sawed. At the time, the die block was the largest piece of marble to have been shipped by rail (Neil 1932). Next, the marble went to Proctor, Vermont for dressing and finishing to the specified dimensions (Figure 4).

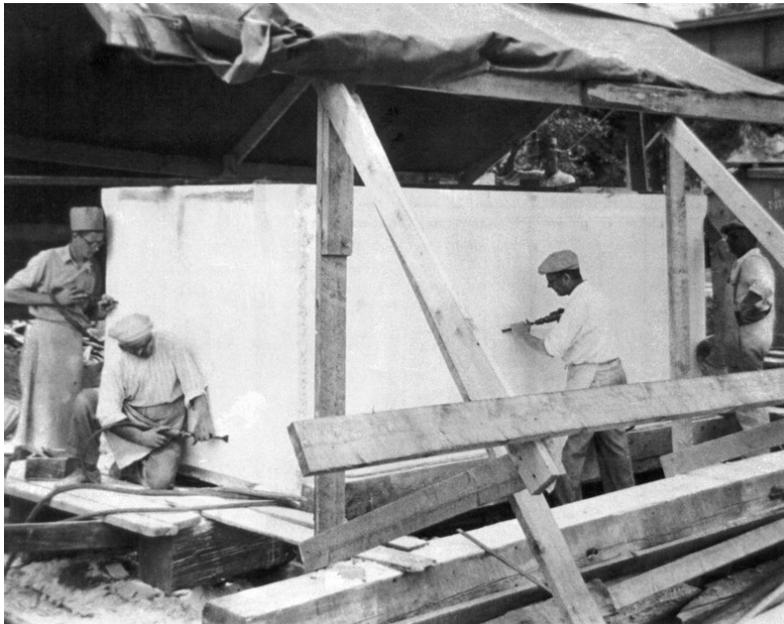


Figure 4: The Die Block Being Finished, Probably in Proctor, Vermont

The cutting and dressing work required six months to complete. From Rutland, the marble was shipped to Arlington National Cemetery, arriving in September of 1931.

Installation of the marble began immediately. The installation of the base was described in the January-February 1932 issue of *The Quartermaster Review*:

An "A" frame, 30 feet high made of 12" x 12" timber, with a winch and a pulley block of 4 sheaves, was constructed on the ground drawn up into a vertical position, and then rolled into its final position alongside and projecting over the Tomb. At the same time, the work of stripping the old marble and concrete from the existing Tomb was carried on. Setting the base was a comparatively simple job, as it was rolled right over its position. Four Lewis holes [a hole wider at the mouth than at the opening, into which a metal pin is inserted] had been provided at the shop and by utilizing these, the stone was attached to the hoisting cable by four turnbuckles, by means of which it was perfectly leveled, prior to lowering it into its final position (Neil 1932).

It was at this time that the flaw in the base was detected. Work stopped for three months until the replacement base was delivered to the cemetery in December, 1931. The old base was removed and the new base installed, ready for the die block. Installation of the die block was nearly as simple as the base. The die block was positioned behind the tomb, where it was jacked and blocked 18 inches above the base. The block was then rolled over the tomb. Again, Lewis holes were installed in the die block, and the turnbuckles and hoist were used to level the die block and carefully lower it onto the base. The "A" frame supported the 54-ton [sic] die block with ease (Neil 1932).

The final piece to be installed was the capstone. Like the die block, the capstone was rolled behind the tomb, where it was lifted approximately 18 feet in the air, and rolled over the die block. Because the top of the capstone would remain visible, no Lewis holes could be drilled. The 1932 *Quartermaster Review* describes the installation of the final piece:

In order to pick the cap up so as to take out the rollers, and lower it into position, a device known as a differential hitch was used. Two blocks of soft wood, each 12" x 12" x 2", at each corner were held in place by a steel cable wrapped six times around the perimeter of the cap. Two shackles were fastened to the three upper strands on one side and two shackles to the three lower strands on the other side. The turnbuckles were in turn fastened to the shackles. Thus when the "A" frame took the weight, this cable was pulling against itself, creating a pressure on the blocks of wood on the corners. The friction between the wood and marble (an area of 8 square feet) held the cap securely and allowed it to be lowered into position without mishap. Thus the work of setting was completed on the last day of the year 1931 (Neil 1932).

Once all of the Tomb Monument's marble pieces were set in place, Thomas Hudson Jones began carving the figures and wreaths on the die block. As he and Lorimer Rich noted in a 1929 article for *The American Architect*, the final design of the Tomb Monument is remarkable similar to the preliminary design submitted for competition (Figure 5).

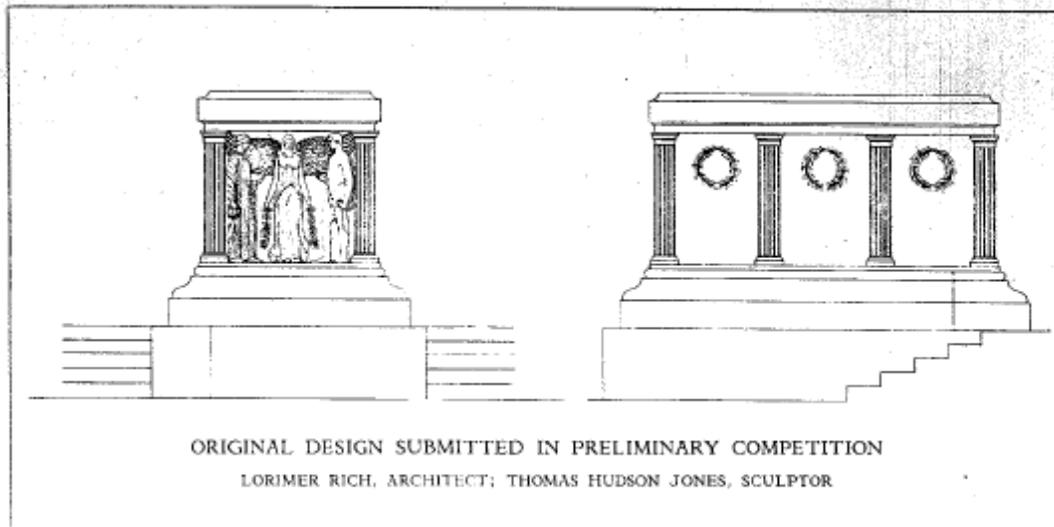


Figure 5: Original Rich/Jones Design (*The American Architect*, January 5, 1929)

The differences are minor; the preliminary design included flutes on the columns; slightly more circular wreaths; and a bolder, more vigorous rendition of the bas-relief figures on the east facade, including a forward-facing, winged “Victory” holding two, not one, palm branches.

The Tomb Monument was completed and opened to the public on April 9, 1932. There was no dedication ceremony, and the memorial has never been officially named.

Description of the Tomb Monument

The Tomb Monument consists of four visible parts. From bottom to top, the parts include the plinth, the base, the die block (the largest block of marble), and the capstone. The plinth (also known as the “sub-base”), the lowest part of the monument, is set into the steps on the east side of the Tomb, and is visible on only the north, east, and south elevations. The plinth is composed of three pieces of marble joined by vertical mortar joints, the only vertical joints on the monument. The plinth's three pieces of marble cover the curb of the vault. The vault containing the remains of the World War I unknown lies deep beneath the plinth of the monument.

The Tomb Monument base is a single piece of marble and measures approximately 14 feet east to west and 8 feet north to south. The Tomb Monument die block is a solid piece of marble weighing approximately 48 tons (the quarried weight of the die block was 56

tons; (Oehrlein 1990). The die block sits upon the base, and is covered by the cap stone. The cap stone is also a single piece of marble weighing 16 tons. All four components of the Tomb Monument are joined by horizontal mortar joints. The total height of the Tomb Monument is 11 feet, the width is 8 feet at the base and 6 feet 8 inches at the top, and the length is 13 feet 11 inches at the base and 12 feet 7 inches at the top.

III. History of Cracking, Study, and Repair of the Tomb Monument

The first documented damage and repair to the Tomb Monument was recorded in 1933, when chips and spalls were observed along the Monument's base above the base/plinth joint. The damage was thought to have occurred from improper mortar hardness, and the pointing of the bad joint was removed (Oehrlein 1990) and presumably replaced. No horizontal cracking of the Tomb Monument was noted at this time.

Currently, the Tomb Monument's die block has two parallel, horizontal cracks, referred to as the "primary" and "secondary" cracks. In November of 1963, a report on horizontal cracking of the Tomb Monument's die block was produced. Although this is the first recorded documentation of the horizontal cracks, it is clear from the extent of the cracking across all four elevations of the Monument in 1963 (Oehrlein 1990) that they had developed and become visible some time before that date.

It is estimated that in 1963 – 1964, the combined horizontal extent of the two cracks was approximately 34 feet around the die block. In 1974, the cracks were noted as extending in excess of 40 feet. By 1989, the horizontal extent of the cracks had increased to 44.6 feet, showing an approximate combined increase of slightly more than 10 feet since 1963.

Surface repairs to the primary and secondary cracks were conducted in 1975, and involved the mechanical widening of the cracks to allow pointing with grout (Oehrlein 1990). This is the first recorded attempt to repair the cracks. By 1989, this grout had failed and was removed. In the same year, the cracks were cleaned and regouted with a high lime grout mixed with a small amount of polymer additive to improve bonding and flexibility. Other than routine cleaning, no other repairs have been conducted to the Tomb Monument since 1989.

In 1988 and 1989, a study of the Tomb Monument was conducted by Oehrlein and Associates (Oehrlein 1990). The study included radar thermography and photogrammetry examination of the die block. At that time, the primary crack extended completely across the north and west elevations of the Monument, across approximately half of the south elevation, and across approximately one third of the east elevation. The total length of the primary crack was 28.4 feet, with an average width of 2.52 mm. The secondary crack extended across approximately seven eighths of the south and east elevations with a total length of 16.2 feet and an average width of 2.5 mm. Radar thermography analysis suggested that both of the cracks are not surficial, but extend partially through the block and will eventually extend completely through the block.

The 1990 Oehrlein report made several conclusions regarding the nature of the Tomb Monument's cracks and their potential for repair. According to the report, the primary and secondary cracks will continue to grow and will become continuous through the stone "within the next 15 to 20 years" (i.e., between 2005 and 2010; Oehrlein 1990:30). The cracks will also continue to widen (Oehrlein 1990:30). Failure of the stone (collapse) is unlikely, due to the internal topography of the cracks. The cause(s) of the cracking is most likely a combination of factors, including incipient cracks that opened with release of pressure from the surrounding rock during quarrying, combined with external stress from quarrying, fabrication, transportation, installation, and thermal effects. The report suggested adoption of a monitoring program to assist in decision making regarding a schedule for maintenance treatment and the eventual replacement of the die block. Arlington National Cemetery has instituted a yearly inspection program of the Tomb Monument, and has determined that the cracks have increased horizontally since 1990.

The same 1990 report documents the deterioration of the marble surface of the Tomb Monument, where up to 2.85mm of the marble surface has been removed through weathering (Oehrlein 1990). Modern increases in the acidity of air and rain may have accelerated this process, and the 1990 study projected that within the next 10 to 20 years, the Tomb Monument will be eroded to the point that it will have a negative effect on visitors' experience. The report also clearly states that the only solutions to the deterioration problem are to enclose the Tomb Monument, or replace it.

In conjunction with the Tomb Monument replacement project, an inspection of the Tomb Monument was undertaken in July 2005. Several experts in field of marble and stone conservation participated in the inspection and subsequent discussions regarding the both the Tomb Monument's current condition, and options for its preservation. A series of questions was developed regarding the monument's potential stabilization, repair, and maintenance. The questions were designed to provide Arlington National Cemetery with the information necessary to make an informed decision regarding the possible repair vs. replacement of the Tomb Monument. The questions, and their answers, may be found in Appendix I of this paper.

IV. Consideration of Alternatives

Arlington National Cemetery has considered various alternatives for correcting the Tomb Monument's cracking problem. Of great consideration in the evaluation of alternatives is the current and future availability of marble of the high quality required for replacing the Tomb Monument. The amount of suitable marble is finite, and the number of quarries is limited. Based on the available evidence, suitable marble is currently available, likely at the Yule Quarry from whence the original marble was quarried. What is much less certain is the availability of such marble in the future. In the consideration of alternatives, Arlington National Cemetery has operated under the assumption that the supply of suitable marble is limited and will not be available in the future. Therefore, replacement marble should be obtained as soon as possible and should not be expected to be available in the future.

Each alternative, and the reasons it was accepted or rejected, are described below.

Alternative A- Do Nothing

The first alternative considered was to do nothing. Under this alternative, the Tomb Monument would not be repaired or replaced. According to the 1990 Oehrlein report, cracking and weathering will continue to degrade the monument to the point where there will be a negative effect on visitors' experience, probably within the next 10 to 20 years. Due to the national historic and symbolic significance of the monument, this alternative has not been given further consideration.

Alternative B- Repair the Tomb Monument

Another alternative to replacing the Tomb Monument is to repair it. Arlington National Cemetery has undertaken efforts to repair and preserve the Tomb Monument for the past 70 years, including the previously mentioned repair attempts in 1933, 1975, and 1989. The 1990 Oehrlein report on the Tomb Monument's condition suggested that the die block's cracks would continue to lengthen and widen, and that enclosure of the stone was the only means of insuring its long term preservation. However, in consideration of the length of time since the 1990 study, and the potential inadequacy of previous repair attempts, Arlington National Cemetery reconsidered the Tomb Monument's possible repair. The previously described June 2005 inspection, and the series of questions and answers generated regarding the Tomb Monument's preservation, were conducted to allow the Cemetery to make an informed decision regarding another repair attempt.

After reviewing the above-mentioned information, Arlington National Cemetery determined that, with the proper materials, repair expertise, and appropriate monitoring and maintenance plans, the Tomb Monument could be repaired again and returned to an acceptable appearance. Repairing the cracks would allow the preservation of the existing Tomb Monument. However, it was also evident that the existing cracks cannot be fixed, and will continue to lengthen and widen over time, with the possibility of additional cracks becoming visible. To repair and preserve the Tomb Monument to the exemplary standards required for a memorial of its transcendent dignity would require a continuous program of grouting, regrouting, cosmetic touch-up, monitoring, and maintenance.

Preservation of the existing Tomb Monument is greatly desired by Arlington National Cemetery. However, the overriding mission of the Cemetery in general, and the maintenance of the Tomb of the Unknowns in particular, is to maintain the Tomb Monument's condition and appearance in a manner that fully reflects the honor, dignity, and reverence for those whom it represents. A program of repeated repair to a deeply flawed monument will not achieve this goal. In addition, it is Arlington National Cemetery's belief that the expenditure of resources to maintain the Tomb Monument would be imprudent when, in spite of anyone's best efforts, the stone will continue to deteriorate.

Alternative C- Repair the Tomb Monument While Procuring a Replacement Stone

This alternative would involve another repair attempt, combined with the procurement of suitable marble to be secured and stored for the later, inevitable replacement of the monument. Under this alternative, if and when the repair attempt fails, marble will already be on hand for replacement. While this alternative at first seems reasonable, it creates various issues and risks that could jeopardize the successful future replacement of the monument. In addition to the same objections for making another repair attempt noted above, this alternative would necessitate the issuance of two contracts, one for the procurement of the stone now, and a second (at what could be a considerably later date) for the sculpting and/or installation of the stone. If a latent defect was found in the replacement stone some years from now, there may no longer be the opportunity to acquire additional replacement marble. Furthermore, the stone supplier and stone sculptor could argue over responsibility for the defect, resulting in legal issues and delays. In addition, utilizing two contractors also increases the opportunity for miscommunication and decreased responsiveness. Finally, the stored replacement stone would have to be moved several times, increasing the risk of damage and mishandling.

Alternative D- Replace the Monument

This alternative would consist of replacing the monument's base, die block and capstone. The die block would be replaced with an approximately 55-ton block of white marble from the Yule Quarry in Marble, Colorado (where the original marble was extracted), or another quarry with similar high-quality marble. The base and capstone will similarly be replaced. Once the marble is selected, an artist will recreate the original design as closely as possible. If any defects or flaws are detected in the marble during installation, they will be detected immediately, as opposed to possibly years later, so this alternative provides the best opportunity to obtain more suitable marble while it is available. This alternative makes use of the current availability of suitable marble, and best insures that the Tomb Monument will maintain its required condition and appearance. At this time, Arlington National Cemetery believes that replacement of three pieces of the Tomb Monument is the preferred alternative.

V. The Tomb Monument and the National Historic Preservation Act

The National Historic Preservation Act of 1966 (NHPA) established the Federal Government's historic preservation system for our nation's fragile, irreplaceable cultural resources. The Act requires the thorough, thoughtful integration of historic preservation into the conduct of Federal agency programs and projects. All kinds of historic properties must be considered by Federal agencies, including historic buildings and structures, objects, archeological sites, historic districts, and traditional cultural properties. A "historic property" means any building, structure, object, site, or historic district that is included in, or eligible for listing in, The National Register of Historic Places. Under the NHPA, historic preservation is to be weighed and balanced along with other public interests.

Section 106 of the NHPA requires every Federal agency to "take into account" how each of its undertakings could affect historic properties. The purpose of this process is not to insure preservation of all historic properties, but to weigh and balance historic preservation concerns along with other public interests. Briefly, the Section 106 process requires the Federal agency responsible for the project to identify any historic properties that may be affected by the undertaking. If any historic properties are identified, the agency then assesses the effects of the project on those properties. If the effect is adverse, the agency consults with the State Historic Preservation Office (SHPO) and others in an effort to find ways to make the undertaking less harmful (i.e., "mitigate" the adverse effect). The public must also be informed of the undertaking and be given the opportunity to comment. The agency may take measures to reduce, avoid, or mitigate the adverse effect, or they may agree that no such measures are available, and that the adverse effect must be accepted in the public interest.

Description of Undertaking

Cracking and erosion of the Tomb Monument has led Arlington National Cemetery to consider the replacement of portions of the Tomb Monument. Based on a 1990 study of the monument, yearly surveys of the monument, recent observations of the Tomb Monument, and careful consideration of alternatives, Arlington National Cemetery proposes to replace portions of the Tomb Monument. Authorization for Arlington National Cemetery's potential replacement of portions of the Tomb Monument is provided in Army Regulation 290-5, *Army National Cemeteries*.

If the preferred alternative is selected, the proposed undertaking will involve the replacement of the Tomb Monument's base, die block, and capstone. The concrete vault containing the remains of the World War I unknown, and the remains of the unknown, will not be altered in any way during this project, nor will the existing marble plinth that surrounds the vault's curb. Neither the World War II or Korean War unknowns remains and vaults, or the Vietnam vault, will be disturbed in any way.

Classifying the Tomb Monument Following National Register Definitions

The physical features that are generally considered to make up the Tomb of the Unknowns consist of various components. For this project, the Tomb of the Unknowns is considered to include the remaining original feature of the first monument (the plinth and the concrete vault containing the World War I remains), as well as the design elements in Lorimer Rich's plan. Those elements include the three-piece marble Tomb Monument located over the plinth and World War I interment, the plaza located between the Memorial Amphitheater and the Tomb Monument, and the eastern approach to the Tomb (including the steps, grass lawn, and sidewalks extending east to Roosevelt Drive). Additional, more recent components of the Tomb of the Unknowns include the vaults containing the remains of the World War II and Korean War unknowns, the inscribed marble covers over those vaults, and the (empty) Vietnam War unknown vault. For the purpose of this undertaking, the only component of the Tomb of the Unknowns that will be affected are the upper three pieces of the marble Tomb Monument located over the World War I unknown.

In the National Register of Historic Places, historic properties may include buildings, structures, objects, sites, or historic districts. In accordance with the definitions of historic properties provided in National Register Bulletin 15, *How to Apply the National Register Criteria for Evaluation*, the Tomb Monument is most properly described as an “object”...a construction that is primarily artistic in nature, relatively small in scale, and simply constructed. Bulletin 15 explicitly includes “monument” as an example of an object.

For National Register purposes, some groups of properties are listed under a single category using the primary resource. Although the Tomb Monument (and the Tomb of the Unknowns in toto) is associated with the Memorial Amphitheater, a “building,” the two properties were constructed at different times and for different purposes. The Memorial Amphitheater was originally constructed to accommodate the increasingly large number of visitors attending memorial services at Arlington, and not as a location for a memorial for the unknown. An examination of a 1919 photograph (Peters 1986:260) showing the Amphitheater nearing completion indicates that the East Plaza of the Amphitheater did not include the vault of original Tomb Monument (plinth and base). In addition, the east plaza was heavily redesigned after the Tomb of the Unknowns monument was installed. Finally, the Tomb Monument’s historic significance is independent of that of the Memorial Amphitheater’s. Therefore, it is inappropriate to group the Tomb Monument under the category “building.”

Defining the Area of Potential Effect

Under Section 106, a project’s “area of potential effect” is the geographic area (or areas) within which a project may directly or indirectly cause an alteration in the character or use of an historic property. Areas where a reasonable chance of effect may occur from the Tomb Replacement Project are limited to the Tomb of the Unknowns and its immediate surroundings. Procedures for the transportation and installation of the new Tomb Monument marble, and removal of the existing marble, shall follow best industry practices, all state and local rules and regulations, and Arlington National Cemetery regulations. For example, no equipment or materials over legal loads shall be placed on the Memorial Bridge or George Washington Memorial Parkway. Therefore, there is no reasonable expectation that other areas of Arlington National Cemetery, including other graves, monuments, or infrastructure components, or other nearby historic properties, will be potentially affected by the project.

Identification of Historic Properties

It is arguable that no mortal construct could give adequate recognition to the American service men and women who made the ultimate sacrifice for their country. Indeed, the ultimate significance of the Tomb of the Unknowns lies not in its physical components, but rather with the remains of those who rest beneath it. Nevertheless, with the passing of time, the Tomb of the Unknowns in general, and the Tomb Monument in particular, has become imbued with its own historic significance. The Tomb Monument has become the nation’s most sacred memorial to American servicemen, and one of the country’s most

recognizable icons. Today, the Tomb of the Unknowns is visited by hundreds of thousands of people each year, and it is difficult to imagine the millions of people who have come to pay their respects since its opening in 1932. With the advent of televised services at Arlington on Memorial Day and other holidays, the image of the Tomb Monument has been provided to countless thousands more. Approximately 2000 wreath-laying ceremonies take place at the Tomb each year. Since 1921, every U.S. President has paid at least one visit to the Tomb.

It has been noted that the various memorials to World War I unknowns represent a “new” type of memorial, unlike the “men on horseback” monuments of earlier wars (Andrews 1994). The memorials to the unknown serve not to commemorate or glorify the battles, but to recognize and acknowledge the sacrifice of a nation in conducting those conflicts. Although earlier tombs containing unknown soldiers exist, they are often more like mass graves, such as the Tomb of the Unknown Civil War Dead at Arlington. It is interesting to note that the Civil War Unknown’s tomb was originally topped with both cannon and shot, while the Tomb Monument is devoid of military accoutrements.

The recognition that the Tomb Monument had become an iconic symbol can be seen in the initial planning for the World War II unknown interment. The original plan for the memorial to the World War II unknown involved construction of a second tomb monument, identical to the first and sited along the same axis (Quartermaster Review, 1963 [1958]). However, representatives of various veterans’ organizations expressed the desire for a single tomb. Although the single-tomb plan was eventually accepted in 1951, the plan called for removing the inscription on the Tomb Monument’s west elevation and replacing it with similar wording, only in the plural (i.e., substituting “American Heroes” for “Soldier”). The final design comprised dignified yet very unobtrusive vaults and marble vault covers for the World War II, Korean, and Vietnam unknowns, interred on the plaza immediately west of the Tomb Monument. The vault covers are flush with the plaza floor and do not significantly alter the public’s view or the setting of the Tomb Monument, and the Tomb Monument was left with its original inscription untouched. The decision not to erect a second tomb monument for the World War II and Korean War unknowns is likely an acknowledgement and recognition of the significance that the Tomb Monument had achieved by that time; the Tomb Monument had become a memorial not only to all United States unknown soldiers, but to all of America’s servicemen and women who served their country.

The Tomb of the Unknowns, including the Tomb Monument, is of transcendent national significance and meets the criteria for consideration as a National Historic Landmark (NHL). National Historic Landmarks are those properties that possess national significance in American history, have exceptional value in representing the ideals that shaped our nation, and have significance for all Americans. The Tomb Monument possesses exceptional value in illustrating the heritage of the United States in history, architecture, art, and culture, and retains an exceptionally high degree of integrity. The Tomb Monument meets NHL Criterion 1 for its outstanding association with the recognition and memorialization of America’s war dead, both known and unknown, over the course of four major wars. The Tomb of the Unknowns is intimately associated with

the interment ceremonies of each of the four Unknowns, as well as with countless time-honored memorials, tributes, and commemorations, ranging from elaborate official visits by national and international dignitaries to simple wreath-laying ceremonies by Boy Scout Troops.

Closely related to Criterion 1, the Tomb Monument also meets NHL Criterion 3, as an object that conveys a graphic representation of a great ideal of the American people. The Tomb Monument serves as the preeminent symbol of the honor, reverence, and respect felt by this Nation to its men and women in the armed services, and especially those who gave their lives in defense of our country. The Tomb of the Unknowns is a symbol of the recognition and gratitude bestowed by this Nation on unknown American servicemen and their sacrifices in the course of four major wars. The interment and memorialization of an unknown soldier from “The Great War” provided a fitting reminder of the great cost paid by our Nation in that conflict (Peters 1986). That association only strengthened with the interment of unknown soldiers from subsequent wars. The Tomb Monument has expressed this great ideal from the end of World War I to today.

Finally, the Tomb of the Unknowns also meets NHL Criterion 4. Lorimer Rich’s design of the monumental approach to the site successfully compliments the grandeur of the Memorial Amphitheater in character and scale, complementing rather than compromising its dignity. The Tomb Monument’s simple but majestic design conveys the appropriate dignity while, in the designers’ words, “maintaining suitable austerity and restraint” (Rich and Jones 1929). Jones’ sculpture on the east elevation is of high artistic value and could be considered the work of a master. Although commemorative properties are not ordinarily eligible for Landmark designation, the Tomb Monument’s age, tradition, design, and symbolic value have invested it with its own historical significance. The Tomb of the Unknowns, an American shrine and symbol of a nation’s respect, meets the National Historic Landmark criteria.

Assessment of Adverse Effects

Assuming the preferred alternative is selected, the proposed replacement of portions of the Tomb Monument will result in the physical removal and alteration of a portion of this object, and will change the character of the monument’s physical features. Wheeled scaffolding and hoist equipment will approach the Tomb using existing roads, and will cross the plaza between the Memorial Amphitheatre east steps and the Tomb. The equipment will deliver the replacement monument, remove the existing monument, and install the replacement stone. Weight distribution on the plaza will be low enough to cause no harm to the plaza or other unknown vaults. Therefore, the project’s effect will be wholly confined to the Tomb Monument.

National Register-eligible resources such as the Memorial Amphitheater and other portions of the Tomb of the Unknowns are located directly adjacent to the Tomb of the Unknowns monument. There may be temporary visual impacts to these resources during the removal and replacement of the monument, but these impacts will be short term.

Upon completion of the project, there will be no residual impacts to visual and aesthetic resources in the project area or elsewhere.

No other part of the Tomb of the Unknowns, the Memorial Amphitheatre, or any other component of Arlington National Cemetery will be physically affected by the proposed project.

In consultation with the Virginia State Historic Preservation Office, Arlington National Cemetery has determined that the Tomb Monument replacement will have an adverse effect upon the Tomb of the Unknowns. Removal and replacement of portions of the original monument will diminish the integrity of the monument's design, materials, workmanship, and possibly association.

Resolving Adverse Effect

Identification of Review Agencies/Stakeholders/Interested Parties

In accordance with Section 106 of the National Historic Preservation Act and its implementing regulations found at 36 CFR 800, Arlington National Cemetery is taking into account the effect of this proposed undertaking on historic properties. Although no formal determination of National Register eligibility has ever been made for the Tomb Monument, Arlington National Cemetery acknowledges that it is of transcendent national significance, and clearly meets the criteria for consideration as a National Historic Landmark. Accordingly, in addition to the Virginia State Historic Preservation Office, Arlington National Cemetery has invited the Advisory Council on Historic Preservation and National Park Service to participate in consultation regarding adverse effects to the Tomb Monument, as provided for at 36 CFR 800.2(B)(1) and 36 CFR 800.10(c). Some stakeholders and interested parties, such as the Department of Veterans Affairs, the Commission of Fine Arts, and the National Capitol Planning Commission, have already been identified. Other stakeholders and interested parties may be identified through the public involvement process described below.

Involving the Public

The potential replacement of the Tomb Monument has received intense media scrutiny at the national level. In addition, Arlington National Cemetery has provided information about the replacement project on its website. To date, no comments on the project's effect on historic properties have been received from the public. In consultation with the Virginia State Historic Preservation Office and other consulting parties, Arlington National Cemetery will identify and implement appropriate methods to further inform the public and obtain their views on the project.

Once any comments from the consulting parties are received and addressed, the plan will be implemented. The public should have at least 30 days to be informed about the project and provide comments.

Memorandum of Agreement

Assuming the preferred alternative is selected, Arlington National Cemetery shall ensure that steps are taken to mitigate the adverse effect to the National Historic Landmark Tomb Monument. Arlington National Cemetery intends to formalize these steps in a Memorandum of Agreement (MOA) among Arlington National Cemetery, the Virginia State Historic Preservation Office, the Advisory Council on Historic Preservation, the National Park Service, and other consulting parties as appropriate.

A draft MOA will be completed after the public comment period has ended, in case other interested parties are identified that need to be involved in discussing potential mitigation measures and drafting the MOA. In addition, any comments received from the public will be considered by Arlington National Cemetery and the other parties in preparation of the MOA. Once a draft MOA is produced, it must reviewed by all consulting parties.

The next steps in the Section 106 process are provided below:

- Implement the Public Involvement Plan
- Identify Additional Interested Parties and Consider Their Comments
- Prepare Draft Memorandum of Agreement (MOA)
- Review of draft MOA by Consulting Parties
- Prepare and Execute Final MOA

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Appendix I

TOMB OF THE UNKNOWN MONUMENT

ARLINGTON NATIONAL CEMETERY

QUESTIONS REGARDING STABILIZATION, ASTHETIC REPAIR, AND MAINTENANCE OF THE MONUMENT

Stabilization

1) Can the cracks (horizontal and vertical) be prevented from lengthening, or will they continue to grow?

Technically no, but what we're seeing in the horizontal cracks is existing cracks becoming visible. The fissures/cracks were most likely formed during mining, carving, or transport, or could be a result of natural flaws in the stone. As the stone is static and not undergoing any stress right now, it is safe to say that what we're seeing are 'internal' cracks becoming apparent. Things such as pressure washing may expedite the cracking, as will freeze/thaw to some degree.

The vertical ones on the north side are a bit more puzzling – we're not sure what caused them, and aren't sure of the rate of growth.

2) Can the cracks be prevented from widening?

No – what we're seeing is the edge of the crack – the microfracture – slightly wearing away due to weathering or previous grout preparation techniques. The crack is only 'widening' on the surface, and there's no evidence of the entire depth of the crack widening.

3) Can new cracks be prevented from occurring?

Referring back to question 1, there are no real 'new' cracks – just internal cracks that are making themselves apparent.

There is question about the vertical cracks, which warrant additional investigation.

4) What is the likelihood of the vertical and horizontal cracks intersecting, and what would result from that intersection?

As the cracks are deep and not surface cracks, if the vertical and horizontal were to connect, most likely nothing will happen.

Aesthetic Repair

5) Can existing hairline cracks be grouted at this time?

Very very fine hairline cracks can't be grouted, but 'normal hairline cracks can be. However, since the crack isn't wide enough to 'hold' the grout, it will erode faster than grout will in wider cracks.

6) How long before the hairline cracks would be wide enough to grout?

Depends...cleaning of the Tomb could force the widening of hairline cracks by forcing dirt/water/etc into the crack.

7) Would injection ports be required to slow the cracks, prevent new cracks, or treat hairline cracks?

This kind of repair is not seen as practical for the cracks on the Tomb – it's more for architectural stone. However, on some areas, grout could be injected with a hypodermic needle to obtain the maximum penetration in the smaller cracks.

8) What grout mixture (lime/sand with biocide?) would be most appropriate?

The secret to the grout is to have it be sturdy enough to withstand the elements, but soft enough to be easily removed. Weathering and cleaning are the enemies of grout.

The grout mixture would be perfected for the monument, but it would be a lime based fill versus synthetic. The lime would have fine aggregate (sand) to match the color/texture of the marble. A biocide would be applied on the outer edge of the grout to reduce mold/mildew growth.

Adhesive, a bonding type of filler, would be used only in areas like the figures on the east side of the monument.

9) In what significant ways would a new repair differ from previous repairs?

The most recent repairs were seen to be very successful. The grout mixture is nearly identical to what would be recommended today, with the exception if applying the lime deeper.

10) How long do you think it would take to completely regROUT all the existing cracks?

Based on working at night when the cemetery is closed and completely removing all evidence of repair from the site every morning, it is estimated that it will take 2 weeks to complete the removal and replacement of grout. It is recommended that this work be done in the spring or fall, as most filler requires temperatures between 50 and 80 degrees.

Maintenance

11) How long will the crack repairs last, before the new grout would discolor, shrink, or otherwise fail and require replacement?

It is estimated that the repairs would last 7-10 years, but could last 12 years with a carefully tailored maintenance plan. An appropriate aggregate (most likely sand) would minimize the shrinking of the filler, and cleaning would reduce the discoloration.

12) When a hairline crack has widened to the point where it could be grouted, would all of the other cracks then need to be regROUTed, to insure a uniform appearance?

No – spot treatment can be done on an as-needed basis without removing existing grout.

13) Is there any way to prevent enlargement of the cracks when removing old grout?

Yes – have a person skilled in monument repair perform the removal.

14) What would be the preferred cleaning protocols to prevent or lessen the enlargement of the cracks?

The recommendations put forth in the 1990 study are still good – steam cleaning is the preferred cleaning, and a twice-a-year cleaning is good.

A successful repair *must* have successful maintenance

General

15) What is the likelihood that a new block of marble would crack?

By consulting a quarry expert for the least-impact methods for removal, this may be minimized. However, due to the geological forces put on the stone, the cutting, and removal of the block, it is likely that a stone of this size will eventually crack.

There are tests that can be performed to read the internal geology of the new block to rule out as many ‘predetermined’ flaws as possible.

16) Have there been any repairs to marble (in the Mid-Atlantic region or elsewhere) that are similar to the repairs now proposed that ANC staff could inspect?

Yes-

-Sculptures at the Pennsylvania State Capitol (Danby Marble) were completed 5 years ago.

-Washington Square Arch in NYC (1 year ago)

-Possibly some work on Lincoln Memorial

17) Is there any known sealant that can be applied to the entire tomb to protect it?

No – this will soil the surface even more.

18) What is the risk that the figures on the East side will fall off?

There is a risk, but it is easy to fix with injecting a small amount of adhesive. There is low risk for major damage on this side.

Appendix II

Strategic Communications Plan for Tomb Replacement/Repair

As of May 24, 2006

1. Mission and Vision

ANC Public Affairs, in coordination with NCA Public Affairs, will plan and execute the public information, community relations and media relations programs for the action taken to repair or replace the Tomb of the Unknown Soldiers.

2. Situation Analysis

Several cracks initially discovered in 1963 have continued to grow around the Tomb of the Unknown Soldier. Arlington National Cemetery hired the Corps of Engineers to look into the matter and present possible solutions. At this time we are collecting data from all interested parties in compliance with Section 106 of the National Historic Preservation Act of 1966. In this process the cemetery is seeking public input from all interested parties to make sure all possibilities are evaluated.

3. Research

The Tomb of the Unknown Soldier is made up of 6 pieces of marble. 3 pieces in the sub base, 1 piece in the base, 1 piece in the die, 1 piece in the cap. The part that is being considered for replacement is the Monument on top of the tomb itself. No matter what course of action is accepted the remains of the WWI unknown will not be disturbed.

In 1963, a fissure was discovered developing along the natural vein of the marble dye of the Tomb of the Unknown Soldier. In 1963, an investigation into the cracks revealed that the crack was growing. In 1975, the first cosmetic repairs were conducted to restore the cracks in the marble. In 1989, a study was conducted to review the extent of the cracks and a determination was made that the cracks were continuing to grow. Several options were considered to try to prevent further damage and to repair the cracks. The cracks have continued to grow.

Currently there are four options. No Action, Repair, Replace, or Procure Marble.

No Action: This option is to simply do nothing. This option has been considered and rejected.

Repair: Currently we are looking into technology and applications that are available to repair the cracks and prolong the life of the existing marble.

Replace: If the Superintendent decides that replacing the marble is the best option a contract will be generated by the Department of Veterans Affairs (VA) to procure an identical block of marble and to recreate the carvings and inscriptions to create an exact replica.

Procure Marble: This option consists of procuring a Marble stone & storing it until replacement is decided upon.

Tomb Timeline:

- 1919 – Monument to unknown dead U.S. Soldiers is proposed.
- 1921- World War 1 unknown interred
- 1925- First guard posted
- 1926- Congress appropriates \$48,000 to build a marble monument over the tomb.
- 1932- The monument, referred to as the Tomb of the Unknown, is completed and unveiled.
- 1933- Cracks noticed at base of marble
- 1963- First documentation of horizontal cracks (internal REPORT)
- 1975- First study into cracks and cosmetic repairs
- 1989- Second study, additional cosmetic repairs
- 2004- MOU is signed between VA & DA (Nov)
- 2004-Digital mapping of existing Tomb is conducted (Nov/Dec)

4. Key Figures

- Arlington National Cemetery
- Department of Veterans Affairs
- Virginia State Historic Preservation Office
- Advisory Council of Historic Preservation
- National Park Service

5. Interested Parties

Internal

- Arlington National Cemetery w/Corps of Engineers, Baltimore District
- National Cemetery Administration
- VA

External

- Senator Charles Robb
- Senator John Warner
- Congressman Frank Wolf
- Congressman James Moran
- Congressman Thomas Davis
- U.S. Commission of Fine Arts
- National Capitol Planning Commission
- Service members
- Family members
- Civilian employees
- Retirees
- Veterans organizations
- Tourists

- Print and electronic media from local and national outlets
- Other parties to be determined

6. Goals

- Educate interested parties on history of Tomb of Unknowns, Situation with crack, and possible options for solutions
- Collect input (suggestions, ideas, and feelings) from interested parties.
- Ensure all options are evaluated
- Generate media coverage to disseminate the information to a wide audience
- Inform public and provide public with the opportunity to comment and to consider those comments in the course of action chosen

7. Strategies to educate public and collect input

- Command Information
- Community Relations
- Media Relations

8. Tactics (to collect input)

Command Information

- Information presentation to Commission of Fine Arts
- Display in Visitor Center with comment cards for feedback
- Information on Website with address to write to, to provide feedback

Community Relations

- Announcements in Veterans organization newsletters and magazines
- Announcements at Veterans organization conferences
- Public Meeting (tentatively scheduled for July 6, 2006)

Media Relations

- News release to local, national and international media outlets

9. Monitoring and Evaluation

- Comment cards collected
- Commission of Fine Arts feedback
- Veterans Organization feedback
- Collecting letters generated from website

10. Coordination and Logistics

- Establish display with comment cards in visitor center
- Prepare presentation for Commission of Fine Arts
- Prepare information inserts for Veteran Organization newsletters/magazines

- Add information to web
- Prepare announcement for local newspapers and press releases for daybooks and wire services