NATIONAL PARK SERVICE
U.S. DEPARTMENT OF THE INTERIOR

NATIONAL CAPITAL REGION
DESIGN AND CONSTRUCTION BRANCH
WASHINGTON, D.C.

Benito Pablo Juarez Monument and Plaza
Investigative Condition Assessment and Report

National Mall and Memorial Parks (NAMA)
Washington, DC

Image Credit: Oehrlein & Associates Architects

REPORT & REPAIR PLAN
FINAL SUBMISSION
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Prepared by:
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Washington, DC

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TABLE OF CONTENTS

All photographs taken by Oehrlein & Associates Architects, unless noted otherwise.

INTRODUCTION

PURPOSE AND SCOPE

Oehrlein & Associates Architects (O&AA) was retained by the National Park Service to conduct a comprehensive investigation and condition assessment of the Benito Pablo Juarez Monument and Plaza at Reservation 134, Virginia and New Hampshire Avenues NW, Washington, DC and to prepare a Condition Assessment Report and Repair Plan.

A survey of existing conditions was conducted by Mary L. Oehrlein, FAIA, LEED AP, Martin Jeffery Howell, AIA and Brad Roeder of Oehrlein & Associates Architects, in November, 2009. The goals of the survey and this report are to:

- Survey the condition of the bronze statue and bronze lettering, including metal patina, coatings and methods of attachment at close range from a hydraulic boom lift;
- Survey granite pedestal base and granite pavers, curbing and steps at the plaza from the hydraulic lift and the ground;
- Survey interior concrete structure at pedestal base to the extent possible through use of a boroscope; and
- Survey metal flashing, sealants, mortar joints and other weatherproofing materials from the ground and lift;

The report provides a written description and photographic documentation of the current exterior conditions at the Juarez Monument and Plaza and provides a repair plan consisting of treatment alternatives and recommendations for repair. Survey plans and elevations depicting existing conditions are provided in Appendix C to aid in the discussion which follows. A cost estimate addressing the various recommendation options discussed in this report is included in Appendix F.

The National Park Service provided a number of documents to aid in understanding the history and construction of the monument as well as the original construction drawings to assist in the existing conditions survey and production of the repair plan. Oehrlein & Associates Architects was able to contact Hamilton Reese, Jr., son of the engineer who prepared the 1960's construction drawings for the Juarez Monument. Unfortunately no records from his fathers' company remain. The Embassy of Mexico made an attempt to contact Fundidores Artisticos in Mexico City on our behalf. The foundry is no longer in

business. Additional attempts were made to contact relatives of former owners of the foundry, but the relatives could not provide much useful information. See Appendix G for additional information.

The monument's existing conditions are outlined and arranged by building material and component. Photographs and drawings accompany the text to illustrate the materials and various types of damage or deterioration.

HISTORY AND DESCRIPTION

The Benito Pablo Juarez Monument and Plaza were constructed in 1968 and dedicated on January 7, 1969. Juarez was a prominent figure in the formation of Mexico's government in the 19th century and the statue was presented to the United States as a gift in response to a gift of an Abraham Lincoln statue from the United States. The bronze statue of Juarez is a duplicate of a statue, originally cast in Rome, Italy in 1891, that currently stands in Oaxaca, Mexico. The duplicate was cast at the foundry Fundidores Artisticos in Mexico City and sent to the United States along with a silver urn containing soil from Juarez's birthplace. According to James Goode's *Washington Sculpture,* 2008, page 214, after casting in Mexico, the statue was "crated and trucked to Laredo, Texas; from there it continued the trip to Washington by rail. The statue arrived with a cracked leg and an arm almost severed; a local welding firm made the necessary repairs."

The bronze statue of Juarez stands 12 feet high and faces northeast on a granite pedestal 13 feet 4 inches high. The granite pedestal consists of shaped granite cladding anchored to a concrete structure with what the original as-built drawings show as steel cramps at the top only. The cladding is supported by a stepped steel-reinforced concrete structure. Bronze lettering that includes a Juarez quote and his name is attached to the northeast face of the granite cladding. The statue and pedestal are located on a 32 feet 6 inches square plaza of granite pavers, curbing and steps. The urn of soil, according to Park Service documents, is interred beneath an inscribed granite paver directly to the southwest of the pedestal. The plaza is approximately 1 foot 6 inches above the adjacent grade. At the northeast end of the plaza, three granite steps descend from the plaza to a concrete walk, which provides access to the public sidewalk.

ACKNOWLEDGEMENTS

Oehrlein & Associates Architects would like to thank Kimberly Benson, the Project Manager & COR for the National Park Service for her assistance in all aspects of the project, and Jennifer Talken-Spaulding, the Acting Chief Resource Management & Cultural Resources Program Manager, for her help in coordinating all of our on-site survey work. Carlos Quesnel Melendez, Counselor for Legal Affairs for the Embassy of Mexico in Washington,

DC provided assistance in trying to contact Fundidores Artisticos in Mexico City and relatives of the owners of the foundry.

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CONDITION SURVEY AND ASSESSMENT

STRUCTURAL

Robert Silman Associates was retained by Oehrlein & Associates Architects to investigate the structural condition of the Benito Pablo Juarez Monument and Plaza. The structural study included site survey, review of previous reports, comparison of site maps, and examination of the 1969 as-built drawings produced by Palmer, Campbell and Reese Consulting Engineers.

Site

The statue and plaza are situated at a traffic circle with a roadway tunnel running below the level of the circle. The edge of the tunnel wall appears to run close to the northeastern portion of the plaza. Structural information regarding the tunnel construction was not available for this study. Vibration monitoring was conducted in November 2009 by Facility Engineering Associates, P.C. to determine the potential effect that vibration caused by adjacent traffic is having on the statue and its supporting structure. The results of this study are discussed in a separate section of this report. The full report is attached in Appendix D.

According to the original as-built drawings, several utilities run under the monument (see figures on page 10). A 24-inch storm drain runs north-south below the northeast corner of the plaza. Two runs of electrical conduits are also identified on the drawings. One group of conduit runs in the northeast-southwest direction, dividing the plaza and statute into nearly equal parts. The other conduit bundle is located beneath the southwest corner of the plaza. The foundations for the statute and plaza were designed to accommodate these utilities, as described in more detail below.

Pedestal

The original as-built drawings show a concrete structure supporting the statue and granite cladding. The construction of the concrete structure could not be confirmed due to the presence of the granite cladding; however, it is clearly identified in the as-built drawings. The upper portion of the structure is shown to consist of four concrete walls creating a square in plan. The walls are shown as 10 inches thick and reinforced with #4 bars spaced at 12 inches. At the base of the walls a thickened, stepped slab creates two shelves to support the granite cladding. Reinforced concrete walls extend down from the slab edge; supporting the slab and retaining the soil below the pedestal (see figures on pages 9 and 10). These walls, in turn, are typically supported on continuous concrete footings. Where utilities pass under

the pedestal foundation walls, concrete beams, varying is size, span over the utilities. The beams are then supported on enlarged footings on either side of the utility trenches.

The original as-built drawings also show that at the top of the pedestal walls there is a 9⅝-inch thick concrete slab supported on a ledge at the interior face of the walls. This slab is set down 9 inches from the top of the walls and supports a series of ¾-inch stainless steel bolts that anchor the bronze statute base and statue to the concrete structure. A 2-inch diameter plastic pipe drain passes through the slab to allow water to drain into the space below. In the southwest pedestal perimeter wall a rectangular opening allows access to the underside of the concrete slab for the tightening of the statue anchor bolts. The opening is currently blocked by the granite cladding and therefore, none of the interior elements could be verified in the field.

The civil survey conducted by Wiles Mensch Corporation found the top four corners of the pedestal to be very level, differing in elevation by not more than 1/2 of an inch. This suggests that the pedestal foundation has not experienced significant differential settlement. The condition of the concrete pedestal structure itself could not be observed due to the presence of the stone cladding; however, no evidence of deterioration in the form of rust staining or concrete spalling was observed. Based on the boroscope investigation performed as part of this study and discussed in more detail below, it appears that the lower granite stones are not anchored to the concrete structure, but are gravity set.

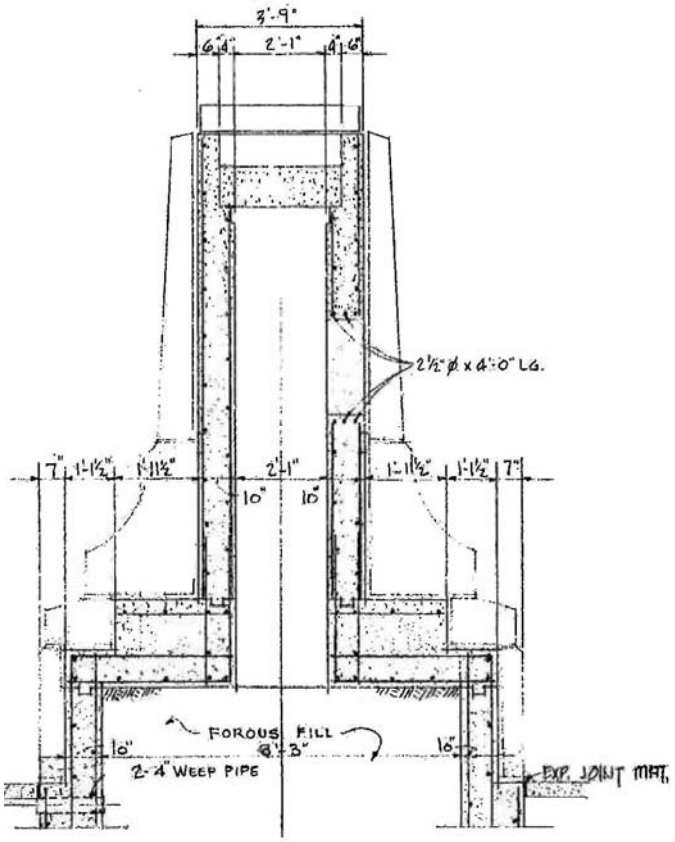
Plaza

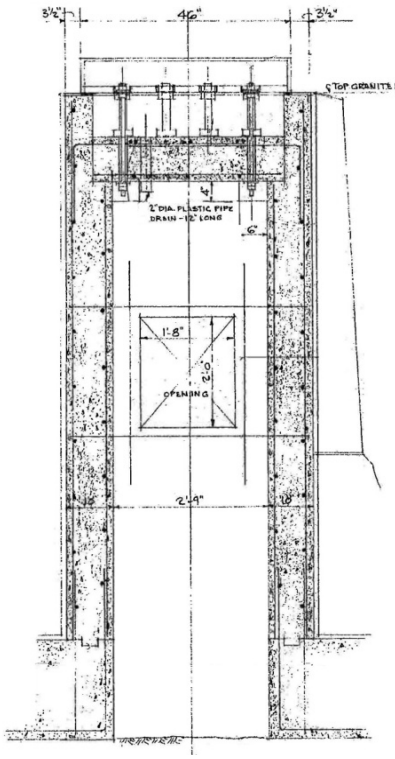
Similar to the pedestal structure, the plaza structure could not be observed due to the presence of the cladding and paving. The structure, however, it is well documented in the as-built drawings. The drawings depict reinforced concrete retaining walls encircling the plaza and encapsulating the soil below the plaza. The walls are shown to be 14 inches thick at the bottom and reduce to a 9-inch thick stem wall near grade, creating a ledge to support the granite cladding on the sides of the plaza. The typical concrete wall reinforcement depicted on the drawings is #4 bars spaced at 12 inches on center. The wall foundations are shown to be continuous footings 1'-10" wide by 1-foot thick. Similar to the pedestal foundations, where utilities run below the plaza foundation walls, concrete beams are shown to span over the utilities and are supported by footings on each side.

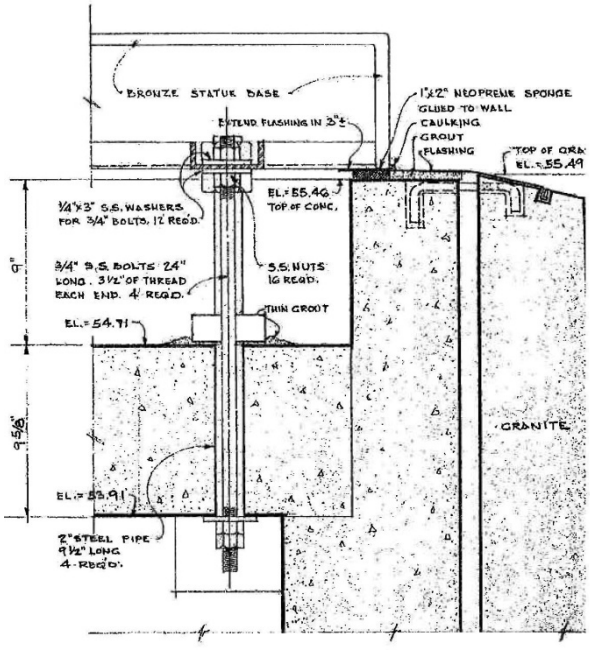
Supporting the granite pavers, the drawings show a 4-inch thick concrete slab-on-grade over 6 inches of porous fill. The slab is isolated from adjacent construction by expansion joints (see figures on pages 9 and 10).

The civil survey of the site found the four corners of the plaza to be nearly level. Excluding the large north and east corner curbstones adjacent to the steps, the corner plaza elevations were found to vary a maximum of 7/8 of an inch, with the high point at the west corner and

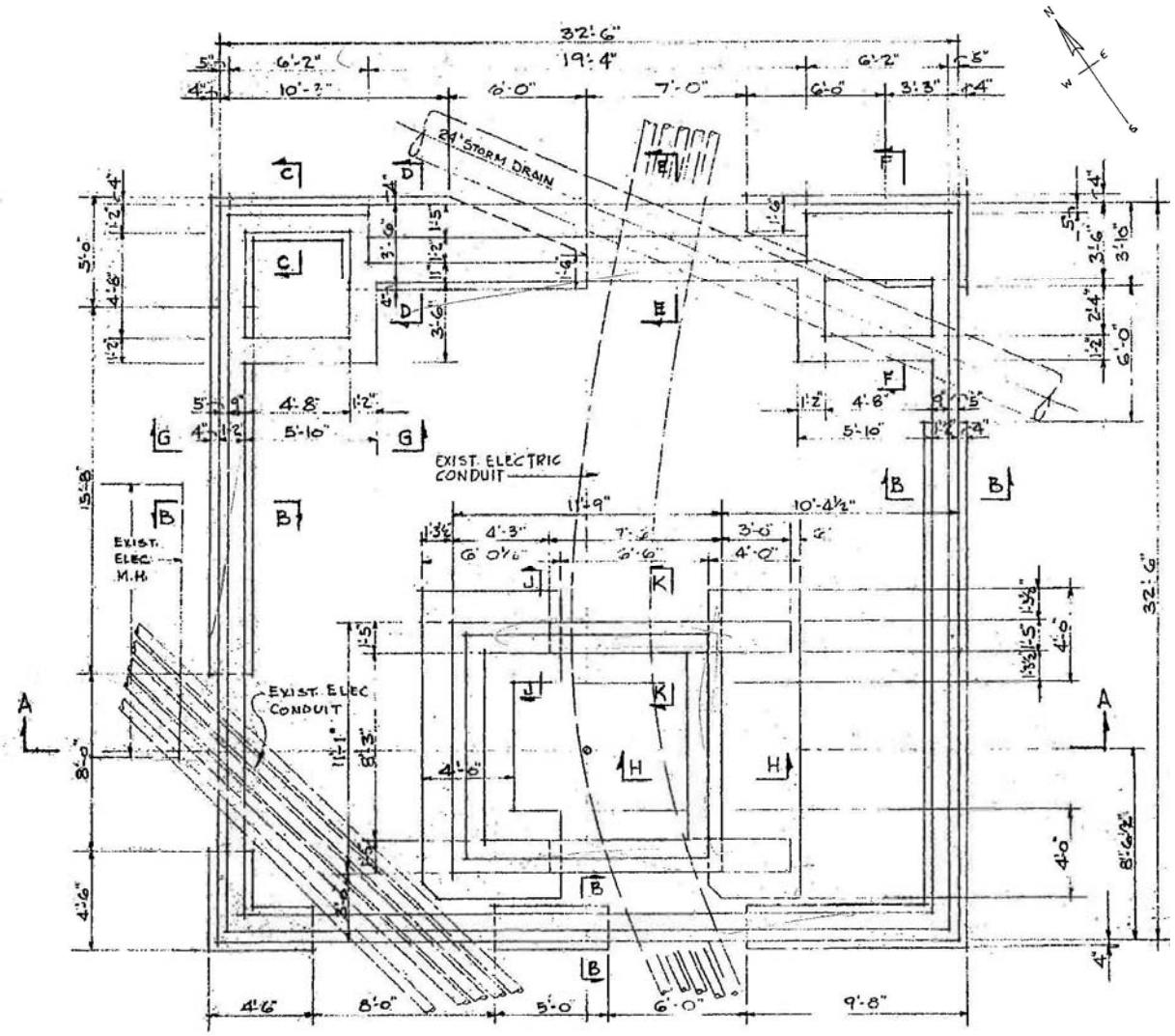
the low point at the south corner. The small variation suggests no significant movement in the plaza foundation, considering that some of the difference can be attributed to loss of the plaza paver setting bed and deteriorated mortar joints. Similar to the pedestal structure, the concrete plaza structure itself could not be observed due to the presence of the stone cladding; however, no evidence of deterioration in the form of rust staining or concrete spalling was observed.



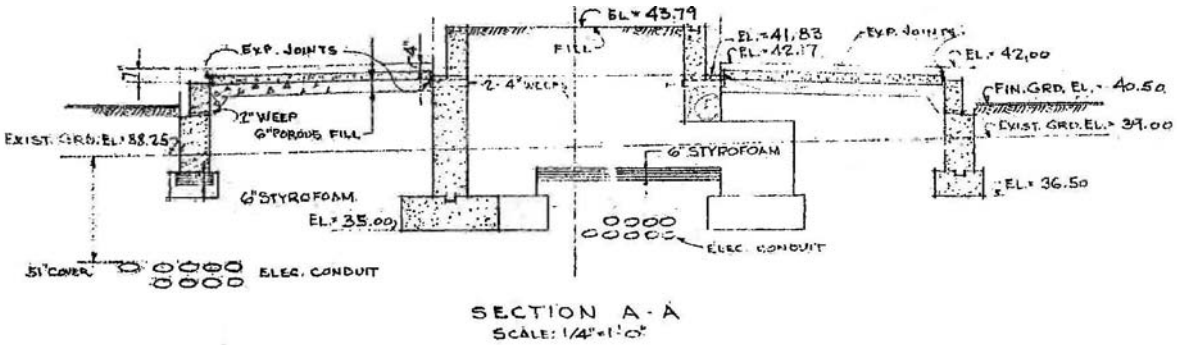




The structure of the pedestal as illustrated in the original as-built drawings by Palmer, Campbell and Reese Consulting Engineers. Section B-B (above) is cut through the pedestal. Section L-L (above right) shows the anchor bolts attaching the bronze statute to the concrete structure. Section N (right) details the statue anchor bolt connection and the metal cramps attaching the granite cladding to the concrete structure.



The foundation plan (above) and section (below) of the plaza structure as depicted in the original as-built drawings by Palmer, Campbell and Reese Consulting Engineers.



SITE

At the southwest side of the monument, three mature trees are located within several feet of the rear of the plaza. Portions of the pedestal and plaza are currently under the drip lines of the tree branches. The shade provided by the trees at this side of the monument likely contributes to the biological growth occurring at the plaza pavers. The shade, in addition to the low slope of the plaza pavers, inhibits the stones' ability to dry out after rainfall and encourages the growth of the algae and moss currently present. The nearby presence of the trees at the plaza also results in falling leaves landing on the plaza. As a nesting place for birds and other animals, the trees may also contribute to the presence of excrement and other deposits on the monument. While the statue itself is not beneath the trees, it is unclear if the trees' proximity encourages use of the statue as an animal perch.

Photograph illustrating the proximity of the trees to the southwest side of the monument and the resulting shade on the plaza.

Additionally, the position of the monument beneath the drip line of the trees makes it possible that the foundation of the plaza is being, or could be impacted, by the root system of the trees. The size of a tree's drip line and root spread are often similar. Without damaging the root structure by excavation, it is not possible to ascertain what impact the tree root system may be having on the monument's foundation. While no damage to the monument is currently visible, as the trees continue to grow, damage may occur in the future.

GRANITE

Granite is the primary facing material of the Juarez Monument and Plaza. Black granite from Cherry Hill, Pennsylvania was used to clad the statue pedestal and to form the plaza pavers, curbing and steps.

Pedestal

The granite cladding at the statue pedestal consists of several blocks of shaped and polished granite of varying profiles and thickness. These blocks are set on the concrete structure to form the various levels of the pedestal including (from top to bottom) the dado, scotia, plinth, surbase and base. The original as-built drawings do not indicate any method of attachment between the granite and the concrete. The drawings show metal cramps used only at the top of the dado to hold it in place, but no other ties or anchoring. Examination of the spaces behind the cladding with a boroscope indicates that the cladding was set in place using shims and spacers but without anchors to the concrete. The stone cladding was not set in a full bed of mortar though the joints were face-pointed to prevent water infiltration. No weep holes currently exist at the mortar joints and there is no evidence that any were ever provided.

The granite pedestal base for the Juarez Monument.

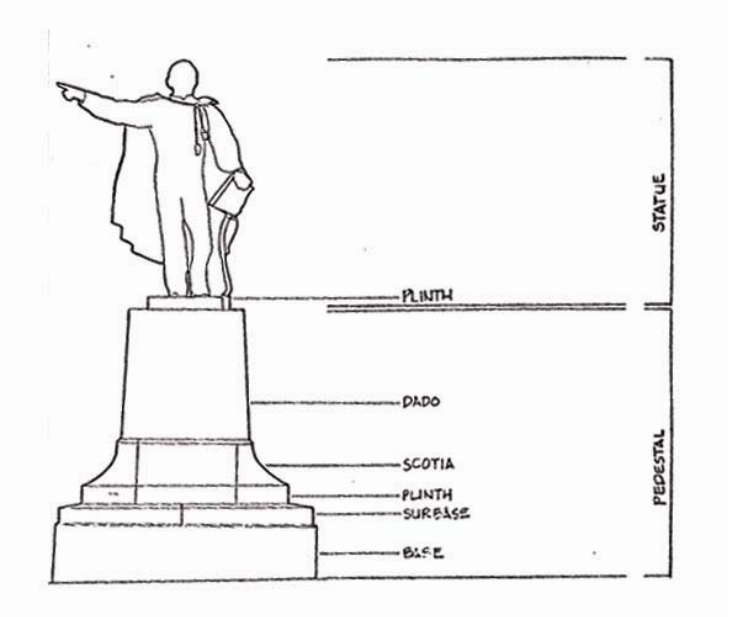


Diagram of the monument's bronze statue and granite pedestal illustrating the individual stone courses referenced in the report. (Diagram Source: "Investigation of Sixteen Selected Statues and Monuments," NPS, April 1985.)

Many of the granite blocks have experienced mild to severe displacement. The movement of the blocks from their original positions

Photographs illustrating the severe stone movement at the north corner of the pedestal surbase. The cargo strap shown was installed by the National Park Service to prevent further displacement.

reaches several inches in some locations. In such instances, the blocks are completely separated from adjacent granite blocks as the pointing has completely failed. The primary cause of the displacement appears to be infiltration of water behind the stones and the subsequent pressure from freeze-thaw cycling. Where the flashing and pointing mortar failed, moisture entered the wall and, due to the lack of weep holes at mortar joints, was trapped between the stone and the concrete substructure. With no path for the water to exit, the trapped water froze and expanded during winter months, exerting pressure on the backside of the stone. As this pressure caused the stone to move, larger gaps were created at the face of the stone and a larger space was created behind the stone. This allowed larger amounts of water to enter, collect and freeze behind the stone, thereby causing additional movement of the stone. As the stones shifted from their original position, the pointing failed further and allowed more water behind the stones, accelerating the entire cycle of displacement and joint deterioration.

Photographs illustrating two examples of the chipping that has occurred at the edges of individual granite blocks at the pedestal.

Additionally, the failed joints and increasing gaps between stones allowed dirt and other debris to collect behind the stone, contributing to the process. Over time the stones have moved so dramatically and the mortar at the joints has failed so completely that water is able to pass freely through the cladding to reach the concrete structure. This condition exposes the concrete structure to increased weathering and deterioration.

The overall condition of the granite at the pedestal is good. There are a few occurrences of minor cracking and four instances of chipped stones. It is unclear if this damage is the result of pressure from the movement described above, an integral flaw in the stone, an impact from an external force, or some combination of the three.

There is soiling at the granite pedestal as well as at the plaza pavers and curbing. The soiling consists of bird and animal droppings, streaking dust and dirt from precipitation runoff, staining from organic material from the surrounding plants and trees and general settling of atmospheric dust and pollution. There is also biological growth on the mortar and stone at the heavily shaded southeast side of the pedestal.

Pavers

The granite pavers at the plaza are laid in a staggered and coursed pattern and vary in size and shape, ranging in area from approximately 2 to 18 square feet. The plaza pavers have a flamed finish and are sloped to direct water away from the statue pedestal towards the four edges of the plaza. Due to the statue's off-center location towards the southwest end of the plaza, the slope of the pavers varies from one side of the pedestal to the others in order to maintain a level surface at the plaza edges. According to the original as-built drawings, the pavers are approximately 2 inches thick and rest on a sloped bed of sand or bedding fines approximately 2 inches thick, which in turn rests on a 4 inch thick concrete slab.

Cracked paver adjacent to pedestal base. (top)
Area of biological growth at the west corner of the pedestal. (bottom)

The granite pavers are largely in good condition, but with a few issues that need to be addressed. A small number of pavers have cracked. In most instances, the cracks are hairline cracks, although they likely extend through the depth of the stone. At locations where the mortar

Low spot at the south corner of the monument plaza has resulted in the collection of soil deposits.

joints have failed, biological growth has taken root and spread onto the granite itself. The heavily shaded west corner of the plaza has widespread algae and moss growing on the pavers near the pedestal. There is general soiling of the types outlined in the section on the granite pedestal as well as dirt from pedestrian foot traffic.

In addition to cracking, the pavers have settled creating depressions in the plaza. The settlement is likely the result of shifting and erosion of the setting bed beneath the pavers. The settlement has possibly been made worse over the years as the mortar joints between the pavers have failed and not been replaced. With no mortar in the joints, large amounts of water are allowed to seep into the setting bed contributing to its general deterioration. In winter months, the water infiltration has likely resulted in some degree of frost heaving of the pavers as the water in the setting bed freezes and expands. Additionally, as the plaza's granite curbing deteriorated as described below, some of the setting bed material may be washed out through the curbing mortar joints. The depressions in the plaza adjacent to the granite curbing allow water to pond on the plaza which contributes to the biological growth and damage to the plaza. The ponding water also results in concentrated deposits of the dirt and debris on the surface of the pavers.

Examples of the shifting and spalling at the granite curbing. Photographs also illustrate the stone displacement at the stair's north cheek wall.

The plaza is bound on three sides by granite curbing with vertical granite facing. The face stone extends down below the adjacent grade. At the northeast side, the curbing terminates at large square granite curbstones that also serve to cap the cheek walls at the plaza steps. The cheek walls also have vertical facing stones. According to the as-built drawings, the curbing and wall cladding are set in mortar beds on a reinforced concrete foundation wall and footing. The granite itself is in good condition with only a small number of cracks and chips. Several of the curbing stones have shifted from their original positions. As the mortar joints at the curbing and plaza pavers have failed, water has infiltrated behind the curbing and collected between the stone and the surface of the concrete structure. Similar to the process that is occurring at the granite pedestal, this water is undergoing a freeze-thaw cycle that is forcing the stone outward. The cycle contributes to the deterioration of the mortar joints and setting beds allowing the intrusion of more water and dirt and thereby accelerating the condition. The curbing and cladding are soiled similar to the pavers. In addition, the vertical wall cladding at grade is heavily soiled due to its close proximity to the soil of the surrounding planting beds.

Example of cracking at the granite curbing.

Cracked granite step. Photo also illustrates the mortar joint deterioration. (top)
Large impact spall at the nose of a granite step. (bottom)

Steps

At the northeast side of the plaza, three granite steps approximately six inches high descend from the plaza level to a concrete

walk that provides access to the plaza from the public sidewalk.

The granite steps are in good condition with only one crack and one spall. The steps are soiled similar to the plaza pavers and curbing.

Mortar

There appears to be a number of different mortars used at the statue pedestal, the plaza pavers, curbing and steps over time. Some joints have mortar that appears to date from the original construction of the monument. This mortar is largely in poor condition with widespread bond failure. In most locations the mortar is missing completely as stone movement and weathering have caused the mortar to fall out of the joint. In some locations the mortar has been replaced and appears to be in fair to good condition. However, much of this replacement mortar has been installed in locations where the stone has been displaced from its original position. The resulting mortar joints are much wider or more irregular than they would have been originally. At the pedestal and plaza pavers, algae has begun to grow on the mortar joints, especially those in areas of the plaza that receive a large amount of shade.

Mortar deterioration at granite pedestal. In many locations, mortar is missing completely. (top) Photograph of a mortar sample taken from a vertical joint in the granite pedestal base on the north elevation. The straight surface on the bottom of the photo was the exterior face of the joint. Evident are several repair campaigns to close the joint, as well as dirt and vegetation. The dark mortar broken into segments at the top of the photo is likely the original mortar. Instead of removing mortar prior to repointing, the existing mortar was simply pushed deeper into the mortar joint. (bottom)

A mortar sample was collected from a vertical joint in the north elevation (see photograph this page). Evident from the mortar sample was that several campaigns to repoint open mortar joints have been performed over time. The original mortar appears to have been a black color. Samples of the original mortar were removed from the granite pedestal base and analyzed for composition. The objective of the analysis was to determine if the original

mortar was appropriate and to determine the composition of the original mortar for matching purposes. The laboratory analysis found that the sample is a pigmented, non-air-entrained Portland cement-sand mortar. The 1:1 proportion of cement to sand does not meet any current industry standard mix proportions (ASTM C 270 *Specification for Mortar for Unit Masonry*). Typical proportions are 1:3 cement to sand. The original mortar was grossly under sanded and would have been very hard and prone to shrinkage. Failure of the bond with the stone could have occurred during curing or shortly after installation. The petrographic analysis indicates that the mortar suffered from expansion fracturing due to freezing and thawing and indicates that the mortar may have been retempered and remixed with other mortar batches at the time of installation. Typically, replacement pointing mortar should match the original mortar composition and color. In this case, however, the original mortar mix was not appropriate and likely resulted in premature failure of the pointing. The original mortar color should be matched, but a better mix design should be used. The full mortar analysis is included in the attached Appendix E.

BRONZE

The monument's statue and lettering are both composed of bronze. The lettering is attached to the pedestal's granite cladding with bronze pins while the statue, according to the original as-built drawings, is attached to the concrete sub-structure by a series of metal bolts.

Statue

The bronze statue depicting Juarez holding a book titled "REFORMA" in his left hand and pointing to the southeast with his right. The statue was cast in sections and assembled, presumably, around some type of interior metal armature.

View of the Juarez Monument's bronze statue from the northeast.

The bronze is generally in good condition with minor deterioration and damage that should be addressed. The bronze likely originally had a dark statuary bronze finish as is typical of monumental statutes of this type. There has been recent refinishing of the statue, probably within the last ten years. The wax used to refinish the statue had dark brown and green pigment additive. Much of the recent wax, however, has deteriorated or worn away completely resulting in streaks and large patches of green oxidation commonly associated with weathered bronze. In archival documents regarding the monument, there is mention of the statue being painted green at one point. The close range survey conducted for this assessment, however, located no remnants of paint on the bronze.

View of the original statuary patination at a protected, recessed area of the bronze. Also visible is the later green and brown pigmented waxes.

The brazing material used to join together the statue's separately cast pieces has become increasingly apparent as the finish of the statue has weathered. This weathering has highlighted the cold joints between cast pieces making them readily apparent. It also appears that the various sections of the statue were cast with slightly different alloys as the color of bronze varies from piece to piece. This is especially apparent at the base of the support adjacent to Juarez's left leg.

As noted in the introduction, the statue arrived in Washington damaged and was repaired by local welders.

View of the rear of the Juarez statue showing variations in the color of the patina. The lighter areas are where the protective wax coating has weathered and the bronze is oxidized. Note the joint line between the cast sections visible at the top of the photo.

Northwest side of the statue base and support. Note the varying bronze color at the bottom of the support indicates the use of a different bronze alloy.

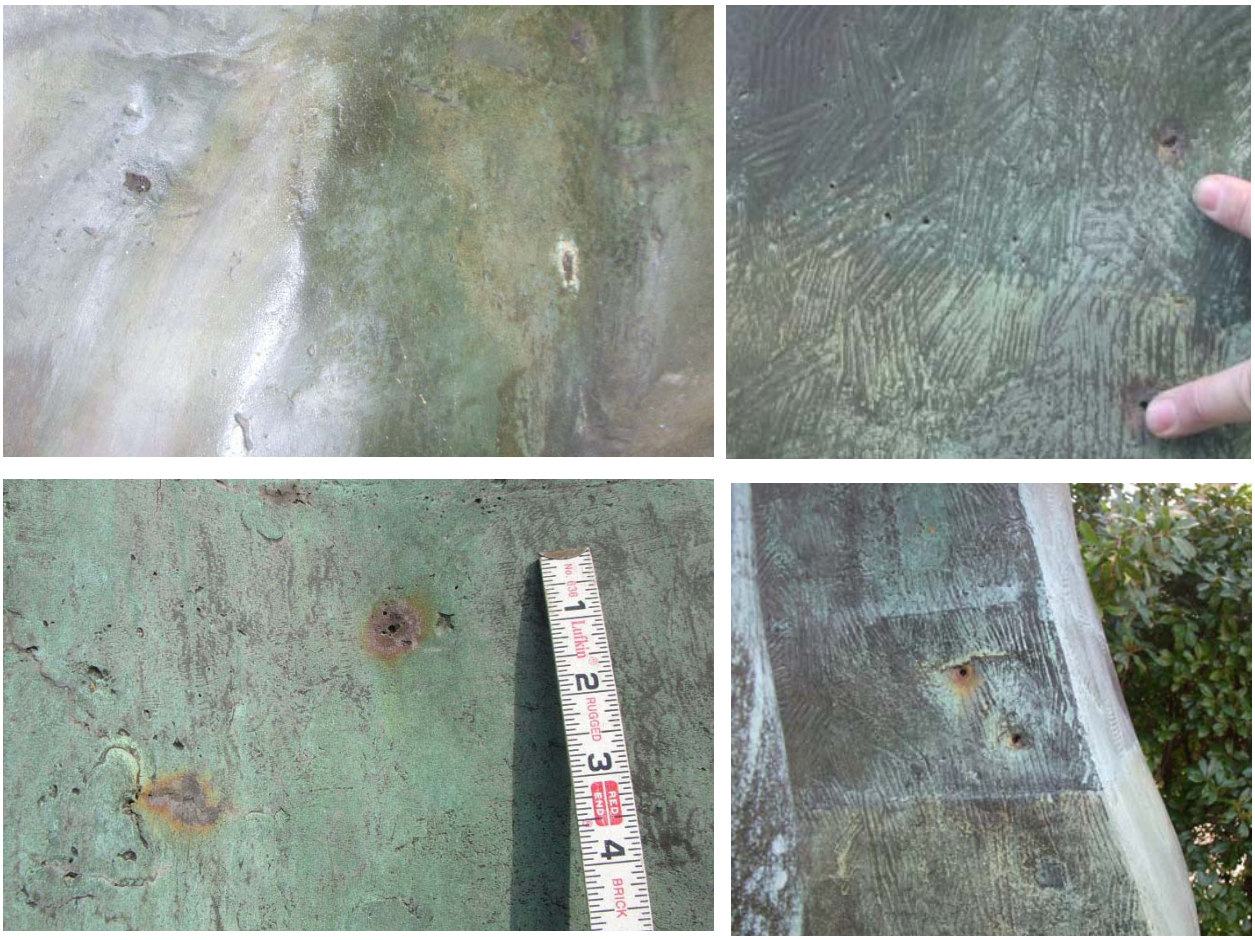
View at the top surface of the right arm showing a brazed seam between cast sections at the left in the photo and brazing repair of shipping damage at the right.

View of the joint between the right arm and hand. The original brazed fabrication joint has cracked and is open.

There are occurrences of cracking at the statue's surface that range from superficial to more significant. The cracks most often occur at the seams between the statue's individually cast pieces, but a number of them exist within the cast sections themselves. A large majority of the cracks are superficial and are likely watertight. It appears that the cracks within the cast pieces are shrinkage cracks that occurred during the casting process and are not a sign of ongoing deterioration. However, there are more significant cracks that are open to varying degrees and expose the bronze to further deterioration. In the area between Juarez's left arm, torso, and cape, there are two large cracks as well as a missing area several square centimeters in size.

The east corner of the statue's bronze base has a ±2 ½ inch high vertical crack through the bronze. The crack is large enough to allow rainwater to enter the interior, thereby increasing the potential of accelerated deterioration of the statue's anchoring system. If the drain through the statue support slab shown on the original as-built drawings is blocked, any rainwater which makes its way into the 9 inch air space between the statue base and the slab will sit on the slab and with time may cause the steel bolts and concrete to deteriorate. This interior condition, however, cannot be observed without removing the statue from the base.

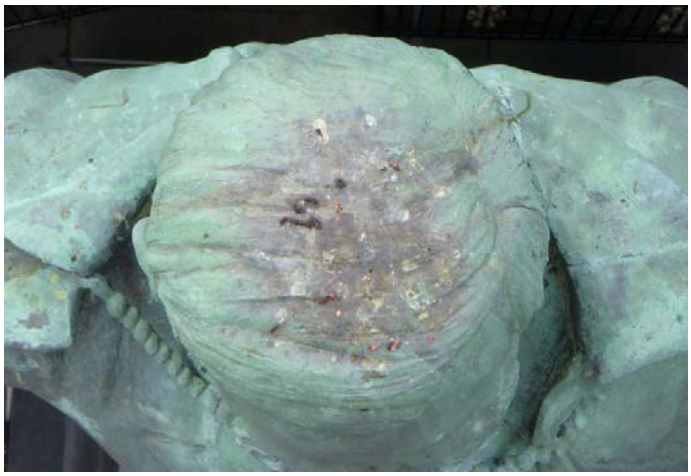
Details of the statue's cape showing surface cracking. (right & bottom right) Detail of the underside of the statue's cape at the left arm showing a crack through the bronze and missing material. (bottom center) Detail of statue base showing a vertical crack through the bronze base. (bottom left)



Pitting at the statue's bronze surface is characteristic of the quality of the original casting. (top) What looks like pitting accompanied by rusting may be remnants of the iron pins used in the casting process or may be iron debris that was present in the original casting alloy. (bottom).

There is minor pitting in various locations throughout the statue. Some of this pitting is a result of weathering and corrosion, but most is simply indicative of the quality of the original casting. There are also a number of small areas of rust that are accompanied by mild to moderate pitting. In some spots, the corrosion pitting penetrates the statue surface completely. This rust may be caused by remnants of iron pins used during the casting process that were not properly removed or may be iron debris in the original casting bronze. During the casting, iron pins can be used to hold the mold together and prevent deformation from the weight and pressure of the molten bronze. Once the bronze has hardened and the molds removed, the remaining pins are typically removed and the holes patched. It appears that a number of pins were not completely removed after casting but simply cut off. As the remaining portions of these pins have corroded over the years, the rust has stained the surrounding bronze. In the instances where the rust surrounds a hole in the statue, what appears to be severe pitting is likely a location where the ferrous metal has either rusted away completely or fallen out.

The statue has various types of soiling on its surfaces. Similar to the soiling described in the section on granite above, much of this soiling is likely caused by precipitation running off over the statue and atmospheric settling of dust and pollution. The statue also has a significant amount of bird and animal excrement on the arms, shoulders and head.



Atmospheric and animal soiling on top statue's head.

Lettering

The bronze lettering on the northeast face of the granite pedestal dado consists of 11 lines of text of various sizes with a bronze relief of Mexico's coat of arms attached near the top of the dado. The bronze is attached to the stone with small bronze pins set in holes drilled into the granite. The pins appear to have been set in the holes with an adhesive.

Detail of the pedestal's bronze lettering showing oxidation and soiling. Note the arrows indicating characters that have rotated out of alignment due to failing anchors and circles indicating loose characters. (top) Detail of the pedestal lettering showing the letter that fell off during the survey. (above)

The bronze lettering has developed a green patina similar to that found on the Juarez statue. In addition to this oxidation, many of the individual characters, and the coat of arms, are exhibiting general soiling that is likely caused by precipitation runoff and atmospheric soiling. The adhesive holding the letters in place has begun to fail in some locations. In some cases, the loss of adhesive has resulted in loose letters. In other locations, the bronze pins have broken off of the letter causing them to rotate in place and fall out of alignment with the remainder of the text. During the on-site survey, one letter, the first "A" in "AMERICA," fell

off the granite completely. Jennifer Talken-Spaulding retained the displaced letter on behalf of the National Park Service; the letter is stored at the Cultural Resource Program Office for later reinstallation.

WEATHERPROOFING

The weatherproofing at the monument consists of sealed joints at the perimeter of the base of the granite pedestal and lead-coated copper flashing and sealant at the top of the pedestal. The flashing at the top of the pedestal is set into a reglet at the top of the stones that form the dado and extends from the reglet to underneath the bronze base of the statue. The reglet, the locations of overlapping pieces of the flashing, and the joint at the bronze statue base are sealed with an elastomeric sealant.

Sealant

The sealant at the pedestal flashing and at the plaza joints is in poor condition. The sealants exhibit substantial ultraviolet degradation including cracking and discoloration. In some areas, the sealants have become rigid, lost their flexibility and the bond with the stone has failed. It also appears, especially at the statue base flashing joints, that sealant repair campaigns have previously been installed directly on top of older, failed sealants without removal of old sealants and without proper surface

Detail of the granite plaza curbing illustrating failed sealant at stone joint.

Detail of the flashing at the top of the pedestal showing multiple sealant installations, all failed. (left) Detail of the stone and mortar beneath the pedestal flashing. The arrow indicates the metal cramp embedded in mortar at top of stone. (right)