Condition Report
St. Mark's Episcopal Church

301 A St SE, Washington, DC 20003

May 1, 2018

AEON preservation services, llc

Hilleary Magruder House
4703 Annapolis Road
Bladensburg, MD 20710

Cell: 301-706-3874
Office: 301-563-9308
Fax: 301-563-9309

Final Condition Report

Aeon Preservation Services, LLC
4703 Annapolis Road
Bladensburg, MD 20710
Phone: 301-563-9308, Fax: 301-563-9309
www.aeonpreservation.com
alfonso@aeonpreservation.com
lane@aeonpreservation.com

To: Ken Allen, St. Mark's Church

Date of Report: 5/01/18

Job: St. Mark's Church Survey & Restoration

Phase: Condition Survey

Report By: Lane Burritt (Principal); Walker Matthews (Sr. Historic Specialist); Jean Stoll (Historic Specialist)

TABLE OF CONTENTS

OVERVIEW

Aeon Preservation Services, LLC complies with the Secretary of the Interiors Standards when both providing professional services, making preservation recommendations, as well as managing or directly implementing work. This standard emphasizes the importance of retaining as much of the original material as possible, as well as to do no harm and ensure that repairs and treatments are reversible. This often results in a less is more approach to architectural conservation.

In the case of St. Mark's Church, in many ways this approach has been taken for previous repairs. However, as will be further detailed in the report, the practices undertaken in recent repairs to the church were not always current industry best practices and, in many cases, improperly implemented. This has resulted in failed or failing repairs and further degradation of existing material.

This is especially the case for the sandstone elements of the church. Patches and other repairs have failed, and the underlying stone condition continues to worsen. Therefore, given previous repairs have already been made to try and lengthen the lifespan of the stone, it is time to start replacing much of the stone to match. Elements that are not skyward facing and therefore not as susceptible to water incursion and are in good condition may and should be left in place or receive Dutchman. However, the stone that is in worse condition and or skyward facing should be replaced to match.

The necessary replacement of elements as described above, in the case of St. Mark's, will go further to maintain the original fabric and appearance of the building, protect its structural integrity, and be more economic in the long term, than it would be to continue down the path reimplementing more temporary repairs.

This report will lay out the method and findings of our condition survey and our recommendations and further explain the conclusions outlined above.

Aeon's Project Team

Lane Burritt – Principal Conservator On-site Documentation & Investigation, Author, Photography, & Editor

Alfonso Narvaez - Principal Conservator On-site Documentation & Investigation, Author, and Photography

Walker Matthews - Sr. Historic Specialist, Author, On-site Documentation & Investigation

Daniel Holcombe - Historic Specialist, Author, On-site Documentation & Investigation

Jean Stoll - Historic Specialist, Author, On-site Documentation & Investigation

HISTORY AND PREVIOUS STUDIES

Building History

St. Mark's Episcopal Church was built from 1888 to 1894 and designed by Thomas Buckler Ghequier of Baltimore. The church was built of brick and Seneca sandstone. The parish house was added in 1926 (on the east side), and an undercroft (basement) was built in 1989. Periods of restoration included work in 1965-6 and 2014.

EXISTING CONDITIONS & RECOMMENDATIONS

Site Survey & Investigation

The initial survey was conducted from the ground, which did not reveal the problems in the upper masonry. That ground survey was followed by Aeon renting an 120' foot articulated manlift to examine the steeple, gable, chimneys, and cornice. The interior of the steeple, and the north chimney were also investigated and photographed.

Based upon the high reach survey, it was apparent that the masonry condition was more complex than initially thought, especially on the steeple and north chimney. As a result, we provided emergency stone repairs, which involved the removal of some unattached stone elements and the pinning-in-place of others. Our goal was to lengthen the lifespan of the damaged stone as much as possible, to give the congregation the best chance for wholesale repairs in the future.

Emergency Repairs

On March 19, Aeon oversaw emergency repairs for unattached or loose masonry. Federal Masonry Services conducted the repairs, using an 120' foot articulated manlift. The repairs and remediation included removal of the steeple finials, securing of the cross and cap stone on the north elevation, removal of the cap stone at the southeast corner of the church and securing of the southeast and archway buttress coping stones.

Emergency repairs gave us an opportunity to better understand previous repairs by seeing up close patching, expose areas that had been improperly repointed, and better determine the strength and soundness of the underlying existing stone.

Stone Condition Overview

The church has several masonry issues. Previous stone patches are at the end of their lifespan. Aeon sounded many of the stone patches. Almost all the large patches and many of the small patches sounded hollow or had cracks and or were separating from the underlying stone. After removing a few of the patches, Aeon discovered that patches were in fact very shallow with little to no tooth to them to help adherence to the underlying stone. They were also not pinned. When we patch today we key in patches with Stainless steel pins and drill holes provide the stone with a proper tooth prior to installing a patch. Aeon is therefore considering all patches to have failed and

Certain repaired elements, such as the spire finials, were found completely separated from their bases and were a serious hazard. The finials were secured with very short pins that were embedded less than ¾" into the substrate. Pins should be stainless steel with a minimum of 3" penetration into each element being pinned.

Overall Brick Condition

The brick itself is in good shape, but the mortar is not. Aeon discovered upon close inspection that the previous repointing campaign skim coated new mortar over failed older mortar. This improper repointing situation has allowed the older mortar to continue to fail behind the now-brittle skim coat replacement mortar loss extends past the outer repointing mortar and continues deep into the wall affecting the bedding mortar. We found voids in the wall that extend past our probes. What we are finding in the walls is mortar that has no binder, it is mostly just aggregate (sand). We will not be able to fully know the extent of the mortar failure until the work begins to remove the skim coated replacement mortar and we can better observe the bedding mortar. To err on the side of caution, Aeon has estimated that the building needs 100% exterior repointing. This will help stabilize the structure, especially the steeple, as mortar not only lends flexibility to masonry walls but acts as the sacrificial element so the bricks themselves are less damaged from compressive action. Mortar is also a good way for moisture to escape the building system.

Water infiltration is also a concern. With the lack of viable mortar and natural porosity of brick masonry, water has seeped into the steeple. Brick staining, both from mortar and efflorescence, is visible on the interior of the steeple. This is a lower priority repair but should be done while there is scaffolded access to the steeple. Repointing should be a high priority. Upper portions will require 100% of pointing and significant amount of deep repointing repairs. As we progress down the tower and around the building, there are fewer mortar concerns however overall condition cannot be established until repointing work is conducted in earnest.

Chimney Condition

The north chimney is a repair priority as it has displaced and rotated in multiple directions. The inside of the chimney has lost so much mortar that entire bricks are exposed on almost all sides and is just barely hanging on. Some have already fallen down the flue. The chimney sags inward on the south side and has rotated toward the north by several degrees. Historic photographs show a buttress supporting this chimney, but little evidence remains today. The removal of this buttress likely allowed the chimney to start rotating. Bricks on the interior show extensive brick damage and loss. There is no mortar left on the interior of the chimney.

The solution to this issue is to completely rebuild the chimney. It is important to note that we do not advocated replicating the buttress. The focus should be on the complete dismantling of the current chimney and a full rebuild to avoid catastrophic chimney failure in the future.

Steeple Condition

The steeple on the northwest corner of the building has considerable issues. After Aeon's condition survey identified several emergency repairs, Federal Masonry Services removed the spire finials and applied temporary moisture barriers. There are still a lot of priority repairs necessary to stabilizing the tower.

Steeple Stone-

There are numerous failed patches on the steeple, especially at the Lantern level. Hollow-sounding patches indicate separation from the original stone, which causes moisture infiltration and further damage, as well as displacement dangers.

The failed patches should be removed. In areas where the stone patches are large and or the surrounding stone has continued to degrade, that stone element should be replaced or in the least receive a Dutchman repair.

In areas where the original stone is not skyward facing and in good overall condition, properly installing a patch may be warranted.

It is important to note that these stone repairs require full scaffolding, which could require opening the roof of the sanctuary. While access is available, all repairs and replacement should be made if possible. It is also important to obtain replacement stone at one time to ensure there are efficiencies of scale. This will greatly reduce overall material cost.

Steeple Brick-

Water infiltration is also a concern for the steeple. With the lack of viable mortar and natural porosity of brick masonry, water has seeped into the interior. Brick staining, both from mortar and efflorescence, is visible on the interior of the steeple. This is a lower priority repair but should be done while there is scaffolded access to the steeple. Repointing should be a high priority. Upper portions will require 100% of pointing and significant amount of deep repointing repairs. As we progress down the tower there are fewer known mortar concerns.

Steeple Wood-

Wood deterioration and damage was noted during the survey. Termite damage was visible on the spire from the interior, as well as at the lantern level on the half-round vented openings between turrets as well as lower down in the tower. Identifying and stabilizing or replacing compromised wooden elements is important for spire stability.

Cornice and Roof Condition

The slate roof is in good condition, with noted rusting on the snow guards. The roof drainage points are causing significant damage to the wood and brick systems below the gutters and cornice. There are two significant areas of concern, the wood sheathing above the gutter that is supporting the roof tile as well as the wooden sill

plate below it. The gutters and roof flashing are not sufficiently protecting the underlying wood resulting in rot and wood loss. The sill plate, which is the wood decking to which the brackets under the cornice and the interior joists attach, is also rotting. Water infiltration is also causing mortar loss and brick displacement below the cornice. The failure of the sill plate is also beginning to cause the roof and cornice to sag. Repairing and mitigating water infiltration at all gutters is a high priority. Failure to address sill plate issues under the gutter may result in damage of roof framing or compromise the roof lifespan.

Staining

There is a fair amount of bio-growth and some carbon staining on the masonry, especially on the west elevation. Other stains on the building include water staining and efflorescence. The staining on the building does not indicate serious issues, and we recommend a general cleaning for the entire building to remove the stains. It is important to note that whatever cleaning method is used, the staining is natural and will reoccur in the future. It is important that the contractor take care while preforming general and specific cleaning to ensure that the cleaning process does not adversely affect other repairs such as repointing or do damage to the building.

CONCLUSION & REPAIR PRIORITIES

Previous repairs, despite all of them not being up to modern best practices, have in many ways achieved the goal of extending the life of the sandstone. However, most of the stone that was previously patched is now in a state in which replacement is required. This is the case for all stone that is skyward facing and previously repaired and therefore especially susceptible to water incursion. The necessary replacement of elements as described above, in the case of St. Mark's, will go further to maintain the original fabric and appearance of the building, protect its structural integrity, and be more economic in the long term, than it would be to continue down the path reimplementing more temporary repairs.

While much of the building has been relatively recently repointed, investigation of the tower and other areas demonstrate that much of the repointing is merely a skim coat that is already failing, allowing water into the masonry as well as providing little to no added stability of the underlying masonry. Therefore, heavy shallow and deep repointing will be required of especially the tower sections. Other areas do need to be addressed but may be postponed to later stages if necessary. The chimneys cannot be postponed and will need to be rebuilt during phase 1.

Any areas of the masonry where repairs are made should also receive general cleaning as well as specific cleaning treatments if necessary to remove staining and other issues. This is a lower priority than the other repairs, however, it should be achieved if possible while access is in place.

Finally, the cornice and roof decking are rotting and beginning to fail due to insufficient flashing and water protection on both the east and west elevations of the historic church. While, complete failure is not imminent, if these issues are not dealt with quickly, the wood decking will continue to rot causing roof sag and eventual failure.

Repair Priorities

1. Tower- Replace and Repair Failing stone; Shallow and deep repointing (100%); Clean Masonry
2. NE Chimney and rest of North Elevation- Replace and Repair Failing Stone; Shallow and deep repointing; Clean Masonry
3. West Elevation Historic Church- Replace and Repair Failing Stone; Shallow and deep repointing; Clean Masonry
4. East Elevation Historic Church- Replace and Repair Failing Stone; Shallow and deep repointing; Roof, Gutter and Cornice Repairs; Clean Masonry
5. Annex- Replace and Repair Failing Stone; Shallow and deep repointing; Clean Masonry

Shop Drawing Package with Dimension Verification	$	17,500
Historic Masonry Repairs	$	284,627
Stone - For Pricing Purposes Vineyard Red Sandstone (102 pieces, 4 new finals)	$	212,297
Scaffold & Hoist	$	107,594
Professional Services (Engineering and Quality Control)	$	65,000
Permits	$	14,400
Construction Fencing & Other Misc.	$	5,750
Removal of Railing Bird Protection, strip and paint rail, & Reinstallation	$	35,000
Allowance Misc. Roof Repair (Due to Scaffolding)	$	11,500
TOTAL	$	753,668

This number is for budgeting purposes only pending the completion of the design phase of services. This contains some allowances and assumptions.