



2015 ANNUAL REPORT

to the

TENNESSEE STATE BUILDING COMMISSION



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February 18, 2016

This Annual Report describes preservation and significant maintenance and management work completed on historic and cultural resources at Andrew Jackson's Hermitage by the Andrew Jackson Foundation (AJF) in calendar year 2015 and proposed work for calendar year 2016. This annual report submission to the State Building Commission (SBC) is required under Tennessee Code Annotated section 4.13.104. The following is a brief description of proposed property acquisition, construction, demolition, alteration, restoration, or preservation works in progress. Projects involving routine maintenance and minor repairs are not included. Projects are listed in order of priority.

Hermitage Mansion

State Grant Projects SBC 529/000 05 2013

In August 2013, the State of Tennessee granted \$660,000 through the General Services Department's Capital Budget for the AJF to complete repairs to the Hermitage mansion. In August 2015, an additional \$154,000 was added to that grant to aid the AJF in the repair of the Hermitage mansion windows and replacement of interior storm windows. The total grant amount was revised to \$814,000 and is broken down as follows: \$359,000 for Phase 2 of the Hermitage Mansion Exterior Restoration; \$214,000 for interior repairs, repainting exterior doors, and to address condensation issues with the windows and interior storm windows; and \$241,000 to analyze and upgrade the Hermitage mansion fire system and security system. These funds are scheduled to be spent by June 30, 2016. Of the above mentioned projects only Phase 2 of the Hermitage Mansion Exterior Restoration is complete.

Hermitage Mansion Sprinkler, Fire Detection, and Security Systems.

The AJF's reports to the State Building Commission in 2013 and 2014 detail the issues with the Hermitage mansion's sprinkler, fire detection, and security systems. In brief, analysis from engineers who specialize in designing these type systems for historic buildings found the sprinkler system to be deficient due to corrosion and insufficient water pressure, the fire detection system to be unreliable due to age and inability to source replacement parts, and the security system to be deficient in terms of coverage, local administrative control, and video surveillance.

Fire Sprinkler System

Because of the estimated \$650,000 cost to replace the Hermitage mansion sprinkler system Hermitage staff prioritized the available \$241,000 in State funds toward the fire detection and security systems. However, staff dedicated a portion of these funds to further analyze the water pressure issues previously reported by engineers and by installation of a nitrogen generator. Please note that the AJF considers the replacement of the fire suppression system as its top capital priority and is actively seeking funding to replace it.



Plaster damage caused by a sprinkler system pipe failure in January 2015.



Typical sprinkler pipe corrosion in the Hermitage mansion, May 2013.

Water Supply Study

Landmark Facilities Group conducted a fire sprinkler system water supply analysis in early 2015. Landmark's report is attached to this document as *Attachment A*. Their findings indicate that if a fire were to occur that the Hermitage mansion attic would have only 59% of the water supply needed to adequately suppress a fire. Landmark postulated two solutions to this issue, one the installation of a fire pump to increase pressure in the piping or two, bringing an additional water supply line onto the property. Of the two options, the AJF prefers option two. The fire pump would burden the AJF with a costly piece of equipment that has long-term maintenance costs and requires battery or generator back-up. The secondary water line may have a higher initial cost than the pump, but it will be more reliable and less costly in the long-term. The AJF plans to use the remaining funding in the fire and security category of the State grant to begin the design and engineering required for this additional water line.

Nitrogen Generator System

Landmark Facilities Group recommended the installation of a nitrogen generator system to purge oxygen and moisture from the Hermitage mansion sprinkler piping to slow the corrosion in the sprinkler piping system. Landmark sufficiently sized the nitrogen generator system to supply the current piping system with nitrogen and any future dry pipe sprinkler system that might replace the existing. In summer 2015, Century Fire Protection, as a sub-contractor for Beacon Technologies, installed a South Tek Systems N-2 Blast 650 nitrogen generator in the

Hermitage mansion. Since installation, the system has maintained its guaranteed 98% nitrogen purity in the Hermitage mansion sprinkler piping. The total cost for this system was \$24,000.



The nitrogen generator in the Hermitage mansion basement, August 2015.

Fire Detection System Replacement

In winter 2015, Landmark Facilities group completed the design of a new fire detection system for the Hermitage mansion. The new system was designed around an industry standard Silent Knight fire alarm control panel that contacts monitoring stations via IP, telephone and cellular connections. The design called for all new smoke and heat detectors, additional smoke and heat detectors in underserved areas, new alarm annunciators, a Protect-o-Wire system to sense fire ignition on exterior porches, and a wired generator panel for backing up this system. Landmark's design and construction administration cost for this project was \$41,000 plus travel expenses. This fee also covered design of the above mentioned nitrogen generator and the water supply study.

In May 2015, Beacon Technologies was awarded the contract to replace the Hermitage mansion fire detection system after winning a competitive bid. Beacon began work in June 2015 and reached substantial completion in December 2015. As of December 31, 2015, only correction of punch list items remain before the project is considered complete. The total project cost to date is \$31,000 and has had no change orders.

Hermitage Mansion Security System

In winter 2015, Seibold Security completed a schematic design of a new security system for the Hermitage mansion. Seibold's schematic design included a non-proprietary access control system, new and additional motion and door contacts to provide proper coverage, an IP based video surveillance system, and installation of fiber communication lines to eliminate lightning issues with copper lines. This schematic design was issued to design/build security contractors in April 2015 and Seibold along with AJF staff judged that Beacon Technologies design/build concept offered the best security system solution at the lowest cost. Seibold also oversaw Beacon Technologies work throughout installation. The total cost of Seibold's services were \$16,000 plus travel expenses.

Beacon Technologies began installation of the new security system in June 2015 and achieved substantial completion in December 2015. As of December 31, 2015 only correction of punch list items remains before the project is considered complete. The total cost of this project was \$61,000.

Hermitage Mansion Window Repairs and Interior Storm Window Replacement

In February 2015, the Andrew Jackson Foundation assembled a team consisting of experts in historic house museum HVAC, preservation architecture, and object conservation to review the issues with the Hermitage mansion windows and interior storm windows. This team was funded by \$14,000 in grants from the National Endowment for the Humanities and the Community Foundation of Middle Tennessee. The team's chief goal was to identify corrections that could be made to lessen condensation on the wood window sashes during the winter months to prevent damage to the windows and trim.

The team identified several significant issues. In terms of HVAC, the engineer and conservator on the team recommended lowering overall humidity levels in the winter months to reduce the risk of condensation. The conservator noted that the objects and the building would tolerate humidity in the 30% to 35% range as opposed to 40% to 45%. The engineer also recommended insulating voids in the bricks around the windows to eliminate cold pockets behind wood trim that might be exacerbating mold issues. The engineer also recommended reworking the HVAC vents so warm air is directed away from the windows.

The preservation architect and engineer recommended clearing paint around the window sashes and opening a small gap at the meeting rails to allow trapped air to move out of the space between the interior storm window and the windows. The preservation architect also

recommended replacing all existing interior storm windows. The existing Plexiglas windows had sagged over time causing the interior windows to pull away from the magnetic anchor strips. Additionally, rust on the metal anchor strips had prevented a tight seal allowing warm moist air into the space between the storm window and the wood window. The preservation architect identified a window system used at Monticello, Thomas Jefferson's Home, that provided for a tight seal, a mechanical not magnetic attachment, and will not damage original material during installation.

Lastly, the conservator recommended that the new windows come with UV and natural light reducing filters to better preserve the objects inside the rooms, especially the seven 1836 wallpapers in the Hermitage mansion.

As part of the FY 2016 Budget, the State of Tennessee awarded the AFJ a grant of \$154,000 in to replace the interior storm windows and repair the windows. In August 2015, the Andrew Jackson Foundation engaged preservation architect Joseph K. Oppermann to design the new interior storm windows and repairs to the existing windows. In October 2015, the Andrew Jackson Foundation awarded a contract to Allied Windows of Cincinnati, OH to manufacture and install the new interior storm windows for the Hermitage mansion. Allied will deliver and install the windows in the second quarter of 2016 for a total cost of \$41,000. The AJF is still identifying a qualified company to repair the windows. The AJF hopes to have a qualified contractor in place during the first quarter of 2016. All window work should be complete by the fourth quarter of 2016.



Typical condition of Hermitage mansion windows from the exterior. Note missing and flaking glazing and paint failures, November 2015.



Mold cause by failed interior storm windows and voids behind wood trim, November 2015.

Tulip Grove

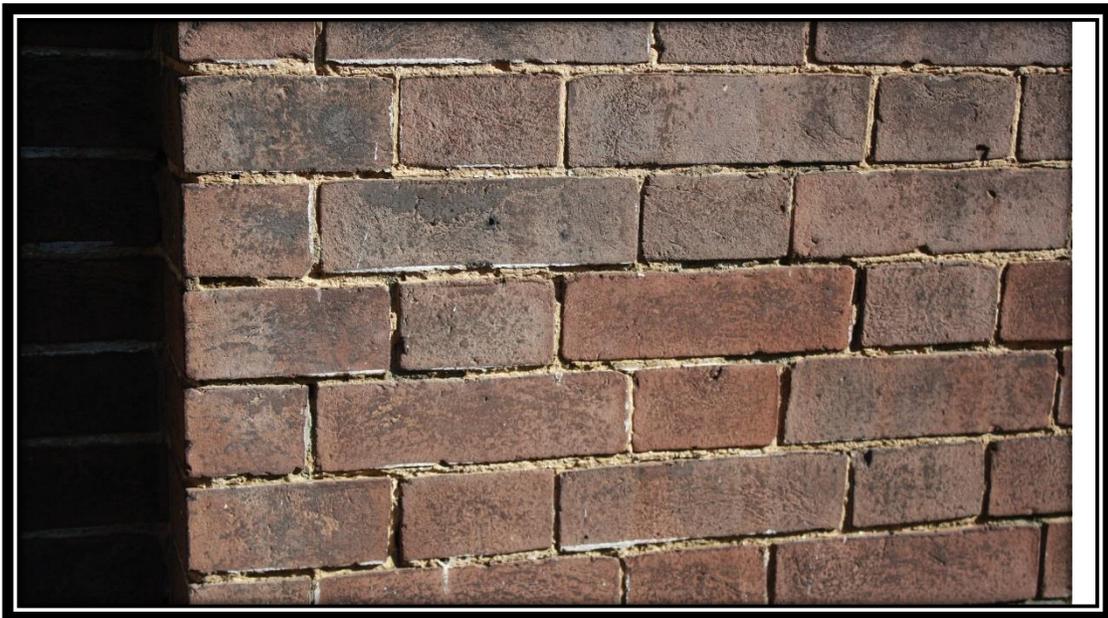
Legal Case

Since 2007, the Andrew Jackson Foundation has been involved in litigation with the descendants of Jane Berry Buntin regarding compensation under the terms of the 99-year purchase agreement for Tulip Grove signed in 1964. The uncertainty of Tulip Grove's legal status has delayed any significant work at Tulip Grove except for emergency repairs and routine maintenance. In 2008, the Tennessee Circuit Court ruled in favor of the AJF regarding the plaintiffs request to invoke the reverter clause in the 1964 agreement. Since then, the Buntin descendants have exhausted all avenues of appeal on that decision. In April 2012, the AJF and plaintiffs went before the Tennessee Court of Appeals to present each party's position relative

to the July 2011 Circuit Court's decision on other portions of the suit. The appellate court issued its judgment in December 2012, stating that the AJF was free to operate the Tulip Grove property in the way it felt best and reiterated past decisions that the AJF had in no way violated the terms of the 1964 agreement between the association and Mrs. Buntin. However, the court did rule that the plaintiffs were owed 1/3 of the income from rentals of the Tulip Grove mansion in addition to 1/3 of the gate receipts for tours. Lawyers for both parties are now negotiating the final details of how reporting and payments will be made to the Buntin heirs for the final 47 years of the purchase agreement. At present, Tulip Grove is open weekdays for tours and on weekends it is rented for special events, mainly weddings.

Tulip Grove's Condition

Tulip Grove requires significant repairs to ensure the integrity of the building's envelope. This includes completely re-pointing the walls and foundation, gutter, downspout, and site drainage upgrades, replacement/repair of wood trim, re-glazing all windows, and painting. The AJF does not expect to have funds in place to pursue this work in 2016 or beyond. The AJF continues to seek funds to complete an analysis of Tulip Grove's building shell problems by a qualified preservation architect. This analysis will include preparation of measured drawings, a condition report, and an historic structures report. Cost estimates for this work are \$55,000. By taking these steps the AJF will have a firm foundation to begin fundraising for repairs once the legal issues surrounding Tulip Grove are settled.



A previous repointing effort at Tulip Grove was not installed deeply enough into the joint. That repointing mortar failed and took off the face of the historic lime sand mortar underneath it. Tulip Grove requires complete repointing on all elevations, December 2015.



Progress of mortar joint decay on South Elevation, December 2015.



Rotted trim board on north elevation at roofline, December 2015.



Trim deterioration at southeast wing east elevation, December 2015.



Decorative dentil trim failed due to leaking gutter, December 2015.



Typical window glazing and paint deterioration, December 2015.



Gutter deterioration, west elevation, December 2015.

Jackson and Donelson Family Cemeteries

Cleaning, Repair, and Replacement

In general, the gravestones in the Jackson and Donelson Family Cemeteries are in fair condition. All require cleaning to remove pollution and biological deposits. The Jackson Family Cemetery requires significant soil backfill to correct soil subsidence likely caused by collapse of caskets and rotting tree roots. In addition, the shared gravestone of Andrew Jackson Jr. and his wife Sarah and the gravestone of Jackson family friend and portraitist Ralph E.W. Earl need immediate attention. Both are made of limestone and the limestone layers are delaminating. Both of these monuments will need to be replaced. In the Donelson Family Cemetery, the vault style memorials for Captain John and Mary Purnell Donelson are unstable because of cracks in the stones and require immediate stabilization.

The AJF is actively seeking funding for these repairs. Staff estimates that the total cost for both of these cemeteries will be between \$70,000 and \$100,000.



Overall image of the Jackson Family Cemetery showing darkening of stones from airborne pollutants and biological growth. The two gravestones in wood boxes are those of Sarah and Andrew Jackson, Jr. and Ralph E.W. Earl.



Overall view of the Donelson Family Cemetery with the Hermitage Church in the background.



Deterioration of Sarah and Andrew Jackson Jr's shared gravestone in the Jackson Family Cemetery. This delaminating stone cannot be repaired. Replacement is the only option, May 2015.



Deterioration of Ralph E.W. Earl's gravestone in the Jackson Family Cemetery. This delaminating stone cannot be repaired. Replacement is the only option, May 2015.

Hermitage Church

Roof, Repointing, and Doorway Repairs

Overall the Hermitage Church is in sound condition, but repairs are needed to maintain the building's exterior shell. First and foremost, the foundation requires repointing as soon as funds are available. The brick walls exhibit mortar deterioration, especially around windows and doors. The building's shingle roof exhibits significant deterioration and must be replaced immediately. The Hermitage Church doors, which are not original to the building, are badly deteriorated as are the locks for the Hermitage Church. Lastly, the wooden wheel chair ramp for the Hermitage Church is deteriorating and should be replaced with a metal ramp. The estimated cost of this work is \$117,000. This project is not currently funded. The AJF is actively seeking funds to repair the Hermitage Church and will complete the work in 2016 if funding becomes available.



Typical condition of foundation mortar joints, December 2015.



Typical condition of mortar in wall joints, December 2015.



Section of roof shingles showing typical deterioration, December 2015. Please note holes in shingle coverage.



Typical condition of roof decking exhibiting rot and deterioration, December 2015.



Image shows twice repaired door bottom and new rot at bottom left, December 2015.



Rotting door threshold requires replacement, December 2015.



Deteriorated handicap ramp to the Hermitage Church, December 2015.

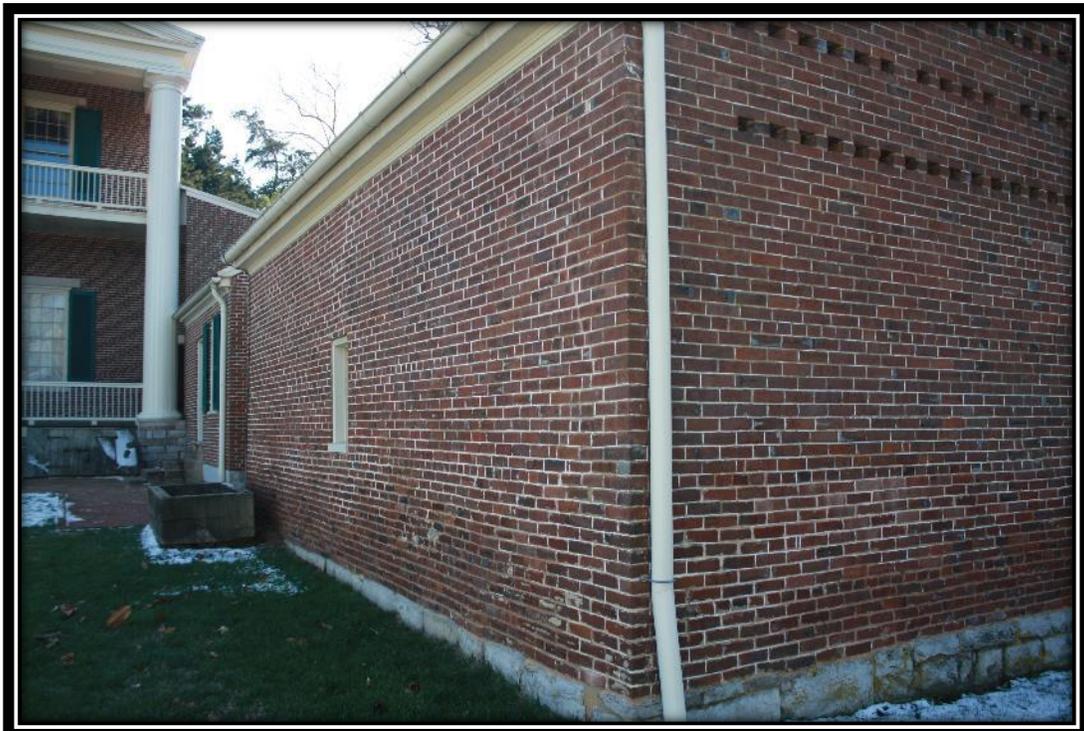
Hermitage Smokehouse

Re-pointing

The Hermitage Smokehouse exhibits mortar deterioration of the lower 18-20 courses of brick and the stone foundation. The cause of this deterioration is salt contamination in the soil surrounding and inside the smokehouse. This is a typical problem with brick smokehouses. Andrew Jackson Foundation research on this salt problem shows that it is expensive and difficult to cure and often cures promoted as permanent, prove impermanent or detrimental to the building. Rather than attempt to cure the problem, the AJF has taken the approach of making mortar repairs as necessary. Typically, repairs are needed every five to seven years. The existing repairs are now in year six of service. Repointing of these joints will cost \$20,000 to \$30,000. The AJF is actively seeking funds to repoint the Hermitage Smokehouse and will complete the work in 2016 if funding becomes available.



Mortar joint deterioration at the smokehouse due to salt and rising damp, December 2015.



Wet and darker looking areas of walls correspond to mortar joints affected by salt and rising damp, December 2015.

End of Report

Attachment A

Hermitage Mansion Fire Sprinkler System Water Supply Analysis



LANDMARK
FACILITIES
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HERMITAGE MANSION FIRE SPRINKLER SYSTEM WATER SUPPLY ANALYSIS

EXECUTIVE SUMMARY

In late 2014 and early 2015, Landmark Facilities Group, Inc., performed a hydraulic analysis of the existing fire sprinkler system in the Hermitage Mansion to determine the ability of the system to suppress a fire in the attic of the building. The attic was chosen because it is the most hydraulically demanding area in the building; that is, if the system performs adequately in the attic, it is likely to be sufficient in all other locations in the building. The results of the analysis is that the system will not adequately suppress a fire in the attic. The calculations indicate that the available water supply of 351 gallons per minute (GPM) is about 59% of the required amount of 597 GPM to adequately suppress the fire. There are two possible approaches to correcting this deficiency:

- 1.) Install a fire pump in the basement of the Mansion to boost water pressure and flow.
- 2.) Revise piping to reduce pressure loss and increase available flow. The pipe modifications might include replacing the service pipe from the property line into the building, as well as pipe in the Mansion.

If Approach 1 is selected, ongoing testing and maintenance of the fire pump will required. The pump would also be subject to failure if there is an electric power outage. If Approach 2 is selected, other piping deficiencies that have been found can also be

corrected such as replacing corroded pipe and adding sprinklers where there is insufficient coverage.

It is believed that Approach 2 is the better long term option to correcting the insufficient water flow problem because:

- 1.) The aforementioned piping deficiencies can be corrected at the same time.
- 2.) The ongoing testing and maintenance of a fire pump would not be required.
- 3.) Pipe modifications would be more reliable than a fire pump since this approach would continue to work during a power outage.

It is recommended that the inadequate water supply for the fire sprinkler system be corrected by modifying the piping layout to reduce pressure loss and increase available water flow.

INTRODUCTION

In late 2014 and early 2015, Landmark Facilities Group Inc. performed a hydraulic analysis of the of the existing fire sprinkler system to determine the ability of the system to meet the requirements of NFPA 13 “Standard for the Installation of Sprinkler Systems” given the existing water supply available. It will be explained why it does not meet the requirements of NFPA 13, the necessity of using a fire pump, and options to using a fire pump.

DISCUSSION

A November 2014, survey of the existing fire sprinkler was conducted to determine the as built conditions of the system. Special attention was paid to pipe diameter, elevations, pipe length, water supply, and other conditions that influence how much water is able to be delivered directly to the fire. In November and December, a hydraulic analysis (a computer program study of the water flow through the existing Mansion pipes) was conducted. Also used in this analysis were the results of the fire hydrant flow tests conducted adjacent to the Mansion in 2011, 2012, and 2013. Fire hydrant flow tests measure the water flow and pressure available to the Mansion at the time of the test, and can be considered a “stress test” of the water supply system. The hydraulic analysis is based on the requirements methods of NFPA 13.

NFPA 13 is updated every about three years to incorporate advances in fire sprinkler technology. It should be noted that during the time frame of the Mansion’s sprinkler system, NFPA 13 has always specified the minimum amount of water per individual sprinkler head. Even though the average in the space may be good, this code stipulates that the minimum water density and pressure applies to each individual sprinkler.

Attached are two sets of hydraulic calculations, and two 11” by 17” drawings. The drawings show the hydraulic node locations and Area #1, which is the hydraulically most

demanding 1,982 square feet area in the attic. It is not required to calculate all the sprinklers operating at once. The hydraulic calculations and the 11" x 17" plans are meant to be used together. The location of the "Nodes" in the calculations are shown on the large plans in the hexagons. Nodes may be sprinkler, pipe junctions, or where water enters the sprinkler system. Briefly, the longer and smaller diameter the pipe, the more pressure is needed to correctly operate the sprinkler.

Please see the hydraulic calculation labelled "Hydraulic Calculation Using Available Water Pressure". This calculation shows how much water is available to the fire based on the existing water supply entering the existing sprinkler system.

On page 15 are some of the Output results showing how much water is flowing (being emitted from) the sprinklers. It can be seen that node numbers 42, 43, 55, 78, and 79, have a flowing density of less than the NFPA 13 required minimum of 0.1 gpm/ft² (gallons per minute per square foot). This indicates that these sprinkler are not flowing enough water on a fire to keep it from growing larger.

It can also be seen on page 15, that all of the sprinklers have less than the NFPA 13 required residual pressure of 7 psi (pounds per square inch). This indicates that none of the sprinklers are protecting an area as large as NFPA 13 requires them to cover, and as a result some areas of fire may have no water at all on them.

Now please see the hydraulic calculation labelled "Hydraulic Calculation That Meets NFPA 13 Required Minimum Pressure of 7 psi and Minimum Density of 0.10 gpm/square foot". This calculation determines the minimum pressure needed entering the system to provide each individual sprinkler with a minimum pressure of 7 psi at each sprinkler, and minimum water density of 0.10 gpm/square foot. These results can be seen on page 15.

Now go back to the calculation using the available water. On page 17 it shows the flow and pressure of the water entering the sprinkler system marked as point A.

On page 17 of the calculation showing 7 psi and 0.10 gpm/ft² at each sprinkler, the water required is marked as point B.

Comparing the points A and B on these graphs, it can be seen that the water required for the entire sprinkler system is 57 psi higher and 250 gpm greater than what is available. It is not unusual that increasing the flow and pressure at the sprinkler itself requires a dramatically greater increase in pressure and flow at the supply inlet to the sprinkler system. This is in large part due to the poor routing of pipe "C" on the exhibit drawing #2.

The site water pressure being supplied to the Mansion becomes dramatically less as the flow increases. This is indicated by the hydrant flow tests conducted, and shown on the page 17 graphs.

What has changed since the sprinkler system was first installed to degrade to the water supply pressure and flow? The following are the major contributors:

- At the time the existing sprinkler system was installed (estimated to be 1980), hydraulic calculations were encouraged, but rarely instituted in buildings of this size due to the high labor cost involved. With the advent of personal computers, hydraulic calculations have become much more common. The older "Pipe Schedule" method of sizing pipe was adequate for the majority of the sprinkler systems, but it was inadequate for the poor pipe configuration as in the attic, and this was proven with the hydraulic calculations. The poor pipe layout as installed does not violate NFPA 13 when originally installed, nor does it now. But it does contribute to the low pressure at the sprinkler, and that causes non-compliance with NFPA 13. We are now much more easily able to view the pressure effects of the poor layout.
- Backflow preventers are now required that were not required on the original sprinkler system. Worse, because of the water main crossing the Hermitage property, the mansion has two backflow preventers on the supply to the mansion. The Mansion is burdened with twice the normal backflow preventer pressure loss as most other buildings.
- It is possible that the pipe bringing the water across the site is not 8" as indicated on the 1981 Bouchard plans, but 6". Pressure losses during hydrant flow tests suggest this possibility, and only place this pipe can be observed, it was 6".

One way of providing enough pressure to the sprinkler system is with a fire pump. Fire pumps are expensive items, have a limited life span and become items that need to be maintained. Because of the aforementioned disadvantages, we should endeavor to avoid them whenever possible.

An alternative to avoid a fire pump is to re-configure (re-pipe) the sprinkler system more efficiently. Hydraulic calculations allow us to find exactly where the pressure losses are in the system, and virtually manipulate the system to determine which pipe configurations will meet the requirements of NFPA 13, at each individual sprinkler, without using a fire pump.

Reconfiguring the piping system to avoid the poor layout with excessive pressure losses is expected to cost much less than a fire pump, while having the additional advantages of being simpler, and not requiring maintenance and testing. There are some synergizes that are available with re-configuring the system. These are:

- a. Sprinklers at node numbers 42 and 43 are obstructed by structure and an HVAC unit so severely as to be almost useless. Eleven other sprinklers are also

obstructed, although less severe. There is also three areas in the attic that are not covered by any sprinklers.

- b. The backflow preventer within the Mansion does not protect the water supply as it is intended to when a fire truck pumps into the system. The main purpose of a backflow is to prevent dirty fire truck water getting into the site's drinking water. This backflow preventer should be relocated out to the exterior pit so as to properly protect the water supply. At this time, it should also be investigated to determine if a double check valve could be used which would have allow greater water pressure to the sprinklers.
- c. Piping and fittings showing early signs of corrosion will be replaced.
- d. The sprinklers in the attic are dated 1980. Replacement or period testing of the sprinklers themselves will be required starting in 2030.
- e. In a re-configured system, the pipes in the attic can be pitched, in accordance with NFPA 13, to avoid freezing. The connected sprinklers serving the second floor should also be fitted with return bends, to avoid freezing.

RECOMMENDATIONS

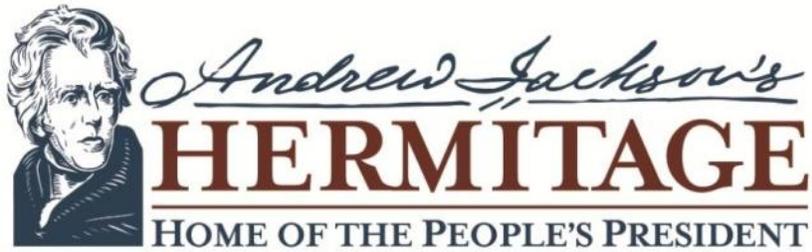
1. To determine what the actual site pipe size that supplies the water, it is recommended that a test pit be dug in some location along the pipe to determine its size. The test pit may be at a remote location away from the Mansion. If only 6" site piping was installed, this should be upgraded to 8" or 10", or connected through to possible new town water piping in Rachael's Lane. Hydraulic Calculations should be conducted for the most demanding building of the site (mansion, AJ Center, utility buildings, other) to determine the correct size of the pipe. Upgrading the (possible) 6" would need to be discussed with the local water department.
2. If the pipe crossing the site is 8, it is then recommended that additional hydraulic calculations be done in the attic to determine if the piping can be actually be re-configured to avoid the use of a fire pump. The use of a double check valve backflow preventer (in lieu of the existing reduced pressure zone backflow preventer) in the Mansion cellar, and the possibility of moving it to the pit should be investigated.
3. If, as proven by hydraulic calculations, the attic piping can in fact be re-configured to avoid a fire pump, contract documents should be generated for a contractor to re-pipe the attic. The area below the attic was not analyzed. Also incorporated will be the synergies discussed in paragraphs a to e above. At the

same time the attic is re-configured, the backflow preventer could be moved out of the Mansion, and into the pit.

CONCLUSION

The existing fire sprinkler system does not meet the requirements of NFPA 13 in regards to supplying enough water to suppress a fire in the attic of the Mansion. This situation can be remedied by installing a fire pump, but this is expensive and invasive to the property. A test pit should be dug to the site water piping to confirm that it is 8". If the site pipe is not 8", then a discussion should be held with the local water company to determine if there are opportunities for an upgrade in an effort to avoid the fire pump.

If the site piping is 8", then additional hydraulic calculations may show that a fire pump can be avoided by less expensive re-piping in the attic. Re-piping in the attic can also address at the same time obstructed sprinklers and dry areas, early corrosion, sprinklers due for replacement, and the pitching of the the pipe to avoid freezing. The same contractors in the attic can also relocate the backflow preventer in the cellar to enable it to perform its' intended function.



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February 28, 2015

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Explanation of Delay in Reporting

The AJF held off submitting the 2014 Annual Report to the State Building Commission to include a report from the archaeologist who monitored excavations during replacement of the Hermitage Mansion Exterior Restoration Phase 2. These excavations uncovered significant archaeological findings that should be part of the public record. The archaeologist who conducted this work provided his services pro-bono other than the direct cost of paying employees who monitored the excavation. Because the archaeologist's reporting services were pro-bono and much more involved than originally thought, the AJF had little leverage to compel the archaeologist to submit the report sooner. Additionally, because the findings are so important the AJF did not want the archaeologist to submit a rushed or incomplete report. In hindsight, the AJF should have submitted this report in February 2015 and simply forwarded the archaeologist's report when it was complete. As of February 2016, the archaeologist's report is not complete, therefore the AJF has chosen to submit the 2014 Annual Report to the State Building Commission without the archaeologist's report. As soon as the archaeologist's report is complete the AJF will submit it to the State Building Commission.

Organizational Name Change

In July 2013 and again in April 2014, the Board of Directors of the Ladies Hermitage Association voted to change the name of the corporation to the Andrew Jackson Foundation (AJF). This decision was based on almost three years of study about the future of the institution. At the April 2014 meeting the Board of Directors also approved changes to its by-laws to reflect the name change. In July 2014, the LHA filed with the Tennessee Secretary of State's office to legally change the corporate name. Later that month the LHA/AJF went before the SBC with a request to approve changes to its by-laws to reflect the name change and other minor amendments. The SBC approved those changes at its July meeting. This report reflects that change and also reflects the renaming/rebranding of the site from The Hermitage to Andrew Jackson's Hermitage.



New logo variation of the Andrew Jackson Foundation and Andrew Jackson's Hermitage.

Hermitage Mansion

State Grant Projects SBC 529/000 05 2013

In the 2013-2014 Fiscal Year Budget, the State of Tennessee granted \$660,000 through the General Services Department's Capital Budget for the AJF to complete repairs to the Hermitage mansion. \$325,000 was set aside to complete Phase 2 of the Hermitage Mansion Exterior Restoration. \$85,000 was set aside to complete interior repairs, repaint exterior doors, and to address condensation issues with interior storm windows. \$250,000 was set aside to analyze and upgrade the Hermitage mansion fire system and security system. State funds for these projects became available in August 2013 and must be spent by August 2015.

Hermitage Mansion Exterior Restoration Phase 2

The main concentrations of the Hermitage Mansion Exterior Restoration Phase 2, Drainage, Foundation, and Pathways Project were to prevent water infiltration into the mansion's foundation and to install safe, water pervious walkways around the mansion. To this end, the AJF retained Joseph K. Oppermann, Architect of Winston-Salem, N.C to design repairs and pathways. Oppermann's designs for this project were detailed in the 2013 Annual Report to the State Building Commission and plans for the project were reviewed and approved by the State Architect's Office. Oppermann provided construction administration and oversight of the project through its completion.

Grau General Contracting of Williamsport, Tennessee won a competitive bid to complete this work in November 2013 and the AJF executed a contract with Grau in January 2014. Grau

began work in January 2014 and completed the project in June 2014. Highlights of the improvements include: installation of French drains on the east, south, and west sides of the Hermitage mansion to prevent water infiltration into the foundation; masonry re-pointing of large sections of the foundation on the east, south, and west sides of the home plus re-pointing the column bases on the north elevation; repair and re-pointing of all the Hermitage mansion's stone steps; installation of exterior lighting and electrical outlets; replacement of all brick pathways and removal of concrete path beds and replacement with more historically appropriate and pervious, brick on sand and crushed gravel path beds; replacement of asphalt pathways with pervious concrete pavement; and the replacement of an historically inaccurate c.1970 well cover with a reproduction of a c. 1880 well cover documented at this location.

During demolition of the existing pathways and excavation for French drains archaeologists from TRC Cultural Resources Management were on site to monitor for archaeological features. TRC's team was led by Dr. Larry McKee, a former AJF staff archaeologist. McKee's findings are attached to this report as Attachment A. In brief, McKee found no evidence of intact archaeological features directly adjacent to the Hermitage mansion foundation. However, McKee found two significant archaeological features very near the mansion. Removal of the brick pathways immediately adjacent to the north steps and column bases of the Hermitage mansion, revealed evidence of a large brick kiln that was the location where the Hermitage mansion bricks were fired in 1819. On the west side of the Hermitage mansion, trenches dug for electrical conduits uncovered a heavily concentrated area of artifacts around the known location for a c.1831 kitchen. Trenching also uncovered the corner of a Jackson era foundation that is possibly the corner of the kitchen.

The total cost of this project was \$359,000 exceeding the original budget by \$34,000.



This photo shows the completed brick pathways and pervious concrete colored and blended with aggregate to match the appearance of the historic carriage drive.



Pathway on the east elevation of the Hermitage mansion. Area to left of pathway is now a planting bed that allows rainwater and runoff to seep into French drain system below.



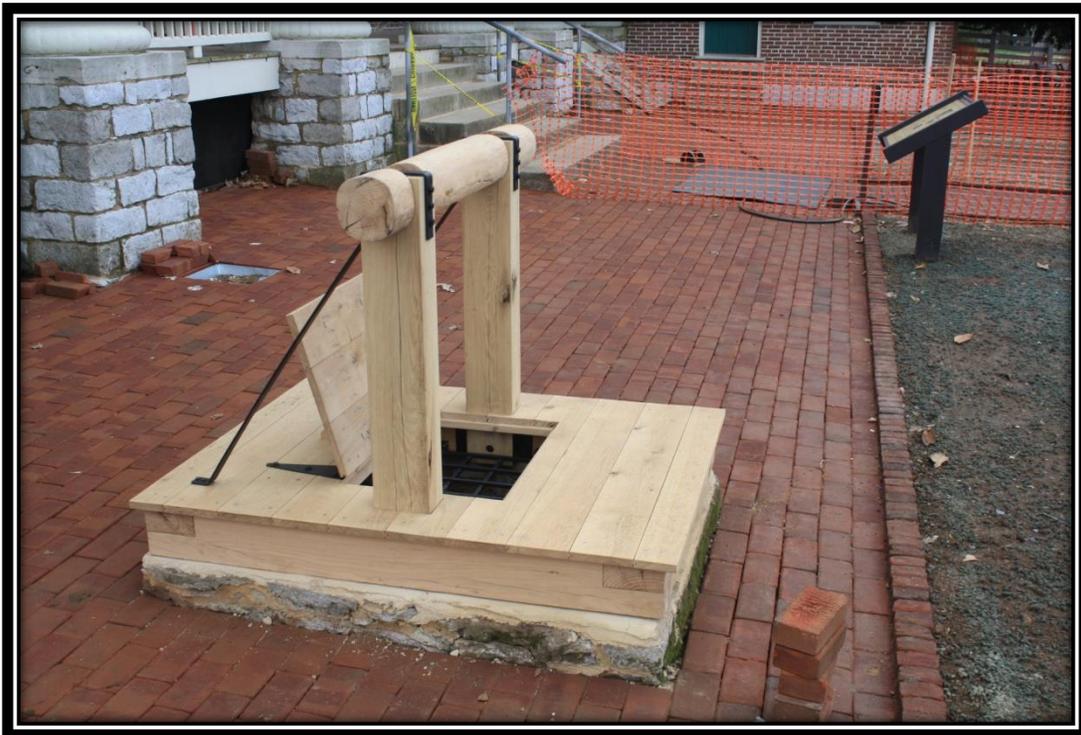
A section of the Hermitage mansion's south foundation wall with re-pointing completed.



Typical French drain installation along the foundation of the Hermitage mansion. Perforated PVC drain covered with cloth, attached to drain lines, and then covered in gravel.



Overhead view of brick kiln site discovered during replacement of Hermitage mansion north pathway. Note ash deposits around orange clay deposits.



New well cover and pathways on the north side of the Hermitage mansion.

Interior Repairs, Exterior Doors, & Interior Storm Windows

The second category of work funded from the State of Tennessee grant was to complete wear and tear repairs to interior hallways, repair exterior doors and re-grain doors, and design replacement interior storm windows that will better control condensation and reduce harmful light in the mansion that might damage the historic collection of objects on exhibit in the mansion.

Annually, 200,000 people visit the Hermitage mansion. The last major repairs to the interior took place in 1995, which means that roughly 3.6 million people have visited the home since that time. The interior repairs focused on repairing and repainting wood trim in the public hallways. Most of the damage was from wheelchairs, walkers, and other metal objects. This work was completed in February 2014 at a total cost of \$15,000.

The interior and exterior door repairs included the physical repair of nine entry doors which had deteriorated due to heavy use. These doors are a combination of originals and reproductions. Local contractors complete this work at a total cost of \$45,000

Due to cost overruns in completing Hermitage Mansion Exterior Restoration Phase 2 the study to design replacement interior storm windows was eliminated from the State of Tennessee grant project. However, the Andrew Jackson Foundation received a Preservation Assistance Grant from the National Endowment for the Humanities in 2013 and a match to that grant from the Community Foundation of Middle Tennessee in 2014. These grant funds allowed the AJF to contract with a preservation architect, an HVAC engineer, and a conservator to design new interior storm windows. This project will begin in February 2015.



*Mold on window casing from moisture infiltration and condensation
in Andrew Jackson's Bedroom.*

Fire and Security System Analysis

The Andrew Jackson Foundation's 2013 Annual Report to the State Building Commission fully detailed findings by Landmark Facilities Group on the Hermitage mansion's fire detection and suppression systems. Briefly, those findings held that the fire detection system required immediate replacement due to age and lack of coverage. In terms of the fire suppression system, Landmark concluded that the system was in working order, but that deficiencies including pipe corrosion, lack of water pressure, obstructed and incorrect sprinkler heads, and insufficient sprinkler coverage limited the system's ability to adequately suppress a fire. Landmark recommended that the sprinkler system be completely replaced and that a water pressure study be conducted to determine if sufficient city water pressure exists.

Landmark estimated the replacement of the fire detection system at \$75,000 and the fire suppression system at \$500,000. This estimate does not include demolition and repair to ceilings to facilitate the removal and installation of piping for the sprinkler system. The estimate also does not include the cost of a fire pump or additional/replacement water lines to increase water pressure. These estimated costs greatly exceeded the \$250,000 available in funding from the State of Tennessee grant for the fire and security systems.

Therefore, the AJF prioritized available funding for replacing the fire detection system, installing a nitrogen generator to fill sprinkler pipes with nitrogen to slow corrosion, and conduct a thorough study of the water pressure issue and make recommendations for how to correct it. Meanwhile, the AJF is studying how to raise the funds to complete the fire suppression system replacement. Landmark estimates it will cost \$125,000 to design and implement the fire detection system, design and implement the nitrogen system, and conduct the water pressure study.

In August 2014, the AJF hired Landmark to design and administer construction of the fire detection system replacement and the nitrogen generator system. Landmark was also retained to conduct the water pressure study. Landmark concluded field work for the project in November 2014. Landmark's initial findings on the water pressure study showed a serious deficiency in water pressure. As of December 31, 2014, Landmark was preparing to put the project out to bid and finalize its water pressure findings. This project is scheduled to be fully completed by June 2015.

The AJF hired Ducibella, Venter, and Santore (DVS) of New York, NY to analyze the Hermitage security system. DVS submitted their final report in February 2014. DVS identified several deficiencies with the current security system and procedures. These issues will not be detailed in this public report for security reasons. DVS estimated the expense for replacing security systems and tightening procedures at \$75,000.

In August 2014, the AJF hired Seibold Security of Rochester, New York to provide schematic designs and quality control for a design/build of a new security system. Seibold specializes in security for historical and cultural sites. In November 2014, Seibold completed its on-site field

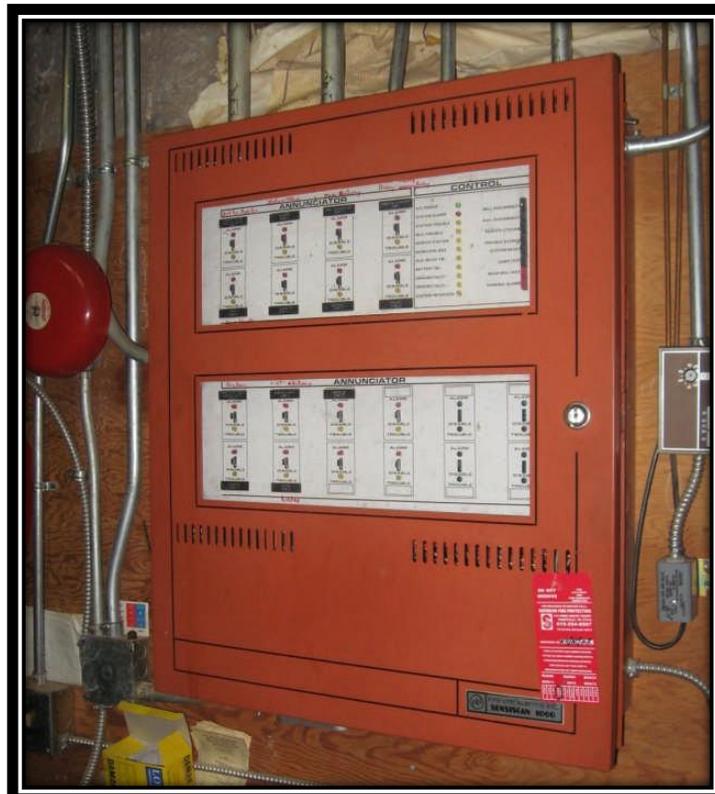
work. In early 2015, Seibold and AJF will select a contractor to complete the design/build based on qualifications and price not to exceed.



This image shows typical Hermitage mansion sprinkler pipe corrosion at a rolled joint.



Typical obstructed sprinkler head in the Hermitage mansion attic.



1988 Fire Alarm Control Panel in the Hermitage Basement to be replaced in 2015.

Tulip Grove

Legal Case

Since 2007, the Andrew Jackson Foundation (AJF), formerly the Ladies' Hermitage Association (LHA), has been involved in litigation with the descendants of Jane Berry Buntin regarding compensation under the terms of the 99-year purchase agreement for Tulip Grove signed in 1964. The uncertainty of Tulip Grove's legal status has delayed any significant work at Tulip Grove except for emergency repairs and routine maintenance. In 2008, the Tennessee Circuit Court ruled in favor of the AJF regarding the plaintiffs request to invoke the reverter clause in the 1964 agreement. Since then, the Buntin descendants have exhausted all avenues of appeal on that decision. In April 2012, the AJF and plaintiffs went before the Tennessee Court of Appeals to present each party's position relative to the July 2011 Circuit Court's decision on other portions of the suit. The appellate court issued its judgment in December 2012, stating that the AJF was free to operate the Tulip Grove property in the way it felt best and reiterated past decisions that the AJF had in no way violated the terms of the 1964 agreement between the association and Mrs. Buntin. However, the court did rule that the plaintiffs were owed 1/3 of the income from rentals of the Tulip Grove mansion in addition to 1/3 of the gate receipts for tours. Lawyers for both parties are now negotiating the final details of how reporting and payments will be made to the Buntin heirs for the final 47 years of the purchase agreement. At present, Tulip Grove is open weekdays for tours and on weekends it is rented for special events, mainly weddings.

Tulip Grove's Condition

Tulip Grove requires significant repairs to ensure the integrity of the building's envelope. This includes completely re-pointing the walls and foundation, gutter and downspout redesign and replacement, repair of wood trim, and painting. The AJF does not currently have the funds in place to pursue this work in 2015 or beyond. The AJF continues to seek funds to complete an analysis of Tulip Grove's building shell problems by a qualified preservation architect. This analysis will include preparation of measured drawings, a condition report, and an historic structures report. Cost estimates for this work are \$55,000. By taking these steps the AJF will have a firm foundation to possibly begin fundraising for repairs once the legal issues surrounding Tulip Grove are settled.



A previous repointing effort at Tulip Grove was not installed deeply enough into the joint. That repointing mortar failed and took off the face of the historic lime sand mortar underneath it. Tulip Grove requires complete repointing on all elevations, May 2010.



Failed mitered corners in Tulip Grove's gutter system have resulted in wood deterioration underneath, May 2010.



Typical mortar joint deterioration over window jack arches.

Jackson and Donelson Family Cemeteries

In general, the gravestones in the Jackson and Donelson Family Cemeteries are in fair condition. All require cleaning to remove pollution and biological deposits. The Jackson Family Cemetery requires significant soil backfill to correct soil subsidence likely caused by collapse of caskets and rotting tree roots. In addition, the shared gravestone of Andrew Jackson Jr. and his wife Sarah and the gravestone of Jackson family friend and portraitist Ralph E.W. Earl need immediate attention. Both gravestones are made of limestone and the limestone layers are delaminating. It is very likely that portions of both of these will require replacement. In the Donelson Family Cemetery, the vault style memorials for Captain John and Mary Purnell Donelson are unstable because of cracks in the stones.

The Hermitage staff and the AJF are actively seeking funding for these repairs. Hermitage staff estimates that the total cost for both of these cemeteries will be between \$70,000 and \$90,000.



Overall image of the Jackson Family Cemetery showing darkening of stones from airborne pollutants and biological growth. The two gravestones in wood boxes are those of Sarah and Andrew Jackson, Jr. and Ralph E.W. Earl.



Overall view of the Donelson Family Cemetery with the Hermitage Church in the background.

Hermitage Church

Overall the Hermitage Church is in sound condition, but repairs are needed to maintain the building's exterior shell. First and foremost, the foundation requires repointing as soon as funds are available. The brick walls exhibit mortar deterioration, especially around windows and doors. The building's shingle roof exhibits significant deterioration and must be replaced within the next two years. The estimated cost of this work is \$85,000. This project is not funded at this time. Hermitage staff is actively seeking grant opportunities and private donations to complete this work.



This image shows failed mortar in the Hermitage Church foundation and walls, May 2010.



Typical condition of church roof shingles. Note split shingles and large gaps in coverage.

End of Report

Attachment A
Archaeology Report

Archaeology Report will be submitted to the State Building Commission as soon as it is completed.