PRESERVATION ASSESSMENT OF THE OLD JONESBOROUGH CEMETERY

Chicora Research Contribution 511

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MANAGEMENT SUMMARY

This study examines what is called the Old Jonesborough Cemetery in Jonesborough, Tennessee. We use the designation inclusively to include not only the original town cemetery that was restricted to its white citizens, but also the adjacent African American cemetery. We were requested to conduct an assessment of the cemetery by The Heritage Alliance. The goal is to provide long-term preservation recommendations to improve care of the cemetery.

The history of the two sections (Euro and African American) is poorly documented, although more is known concerning the white cemetery than the associated African American burial ground. Additional historical research was not included in this preservation assessment, although it could productively be pursued. It appears that the town owns the white section; ownership of the African American section is uncertain, although the town has assumed maintenance.

Our first recommendation is that the town obtain fee simple ownership of all cemeteries it intends to maintain, using quit claims or whatever legal means are appropriate. It will be very difficult (perhaps impossible) for the town to assume appropriate control and care without having ownership authority.

Our second critical recommendation is that no additional burials be allowed in any of the cemeteries without a deed to prove plot ownership and the family assuming all responsibility for any damages incurred during the grave opening and closing. It is very difficult to maintain the historical integrity of a property if new "additions" are being made on a regular basis. Gradually new, granite memorials will overwhelm the landscape, detracting from the existing appearance. In addition, without detailed records it is difficult to determine if there are unused plots. Allowing additional burials under such conditions poses a significant liability to the town.

It is also important for all stewards of historic cemeteries to realize that these properties are social, historic, architectural, and archaeological artifacts. When there is little else physically remaining of a community's earliest history, the local cemetery provides a unique tie to the past that would otherwise be lost.

Therefore, historic cemeteries require very specific consideration and different care from the other types of open sites found in most communities. They also require care different from that typically given to modern city parks and other recreation facilities.

Most notably, historic cemeteries require caregivers to give careful attention to the Secretary of the Interior's Standards for Preservation. These guidelines should be adopted by the Town of Jonesborough and should guide all future actions.

Over the years the cemetery has received uneven care. The landscape has been inexplicably altered. Markers have been damaged through inappropriate care and management. Many graves are no longer marked (or may never have been marked). As a result of deferred or inappropriate maintenance, a number of issues – many of them critical and costly – require the town's immediate attention.

This report evaluates these needs, classifying them into three broad categories:

- Those issues that are so critical – typically reflecting broad administrative issues, health and safety issues, and issues that if delayed will result in significantly greater costs – that require immediate attention during the immediate fiscal or calendar year.

- Those issues that, while significant and reflecting on-going deterioration and concerns, can be spread over the next 2 to 3 years. This allows some budgeting flexibility, but this flexibility should not be misconstrued as a reason to ignore the seriousness of the issues.

- Finally, those issues that represent on-going maintenance and preservation issues. These costs can be spread over the following three to five years. Like the Second Priority issues, this budgetary flexibility should not be interpreted as allowing these issues to slide since further delay will only increase the cost of necessary actions.

At the two cemetery sections we recommend work totaling $127,850 spread over five years. The first phase, costing $53,950, includes critical fence maintenance work, conducting an assessment of the stones and their conservation needs, and developing regulatory signage for the grounds.

Second phase work, with a cost of about $35,900, includes inspecting and pruning the trees, mapping the cemetery, informational signage, construction of a pathway or trail between the two sections, and replacement of a failed plot wall. There will also be additional conservation costs that cannot be determined until the phase one conservation assessment is completed.

The third phase costs are about $38,000, with additional funds probably being needed for continued conservation treatments of monuments. The currently identified tasks, however, include renovation of the turf in the cemetery, the development of a brochure for the cemetery, and additional historical research to support the brochure.

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INTRODUCTION

The Project

In early August 2008 The Heritage Alliance in Jonesborough, Tennessee, a local partner of the National Trust for Historic Preservation, contacted Chicora Foundation to arrange an assessment of the community's historic cemetery. Arrangements were made to conduct the cemetery assessment on Friday, November 7, followed by a two-day cemetery preservation workshop on November 8-9.

Figure 1. Vicinity of Jonesborough in northeastern Tennessee.

Jonesborough is a small, but rapidly growing community in northeastern Tennessee. It is about 7 miles west of the much larger Johnson City, Tennessee, but Jonesborough is the county seat of Washington County, Tennessee. Jonesborough is known as Tennessee's oldest town and also as the birthplace and home of the National Storytelling Festival and International Storytelling Center. The community has a rich history, tracing back to at least 1772. As a result, its cemetery, known simply as the Old Jonesborough Cemetery, has graves dating back to the very early nineteenth century.

As will be discussed more fully in a following section, the cemetery consists of both white and black sections (sometimes these sections are given different names, but they are being considered together in these discussions for convenience), although the history of neither is entirely clear. Nevertheless, Jonesborough, as well as much of eastern Tennessee, was strongly pro-Union with very early abolitionist activities. Thus, the African American cemetery holds special importance.

The project was coordinated locally by Mr. Justin Sanders, Preservation Field Representative of The Heritage Alliance and the Alliance's Director, Ms. Deborah Montanti. We were also able to meet with Mr. William Russell of the Jonesborough Parks and Recreation Department, who has responsibility for the maintenance of the cemetery.

The goal of this project was to develop long-range preservation goals and plans for the cemetery, focusing on not only the landscape maintenance needs of the cemetery, but also on conservation work necessary to stabilize or forestall additional deterioration of the cemetery's stone and ironwork.

Preservation Fundamentals

Preservation is not an especially difficult concept to grasp, although the key principles are not always clearly articulated. The fundamental concepts are well presented in the Secretary of the Interior's Standards for Preservation (see Table 1).

This document reminds us – at least at a general level – of what caregivers need to be

Table 1.
Secretary of the Interior's Standards for Preservation

1. A property will be used as it was historically, or be given a new use that maximizes the retention of distinctive materials, features, spaces, and spatial relationships. Where a treatment and use have not been identified, a property will be protected and, if necessary, stabilized until additional work may be undertaken.

2. The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

3. Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate, and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.

4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, color, and texture.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

thinking about as they begin a cemetery preservation plan. Those responsible for the care of the Old Jonesborough Cemetery should be intimately familiar with the eight critical issues it outlines.

For example, all other factors being equal, a cemetery should be used as a cemetery – not to walk dogs, not as a playground, and not as a park. And until the caregivers are able to do what needs to be done, it is their responsibility to make certain that the site is preserved – it must not be allowed to suffer damage under their watch.

Caregivers must work diligently to understand – and retain – the historic character of the cemetery. In other words, they must look at the cemetery with a new vision and ask themselves, "what gives this cemetery its unique, historical character?" Perhaps it is the landscape, the old and stately trees, the large boxwoods, or the magnificent arborvitae. Perhaps it is the very large proportion of complex monuments, or the exceptional slate markers. It may simply be that it is a unique representation of a cemetery type rarely seen in a rapidly developing urban setting. Whatever it is, those undertaking its care and preservation become the guardians responsible for making certain those elements are protected and enhanced (whether they are particularly appealing to the caregivers or not).

Whatever conservation efforts are necessary must be done to the highest professional standards; these conservation efforts must be physically and visually compatible with the original materials; these conservation efforts must not seek to mislead the public into thinking that repairs are original work; and the conservation efforts must be documented for future generations. If the caregivers aren't conservators, it is their responsibility as the stewards of the property to retain a conservator appropriately trained and subscribing to the Code of Ethics and Standards

of Practice of the American Institute for Conservation (AIC).

The Secretary of the Interior reminds those responsible for the resources that each and every cemetery has evolved and represents different styles and forms. It is the responsibility of caregivers to care for all of these modifications and not seek to create a "Disney-land" version of the cemetery, tearing out features that don't fit into their concept of what the cemetery "ought" to look like.

Figure 2. Overview of the Old Jonesborough Cemetery, looking north from the entrance.

Likewise, caregivers are reminded that there will be designs, monuments, and other features that characterize the cemetery – and the caregivers are responsible for identifying these items and ensuring their preservation. Caregivers must be circumspect in any modifications, ensuring that they are not destroying what they seek to protect.

Before acting, those responsible for preservation are required as good and careful stewards to explore and evaluate the property, determining exactly what level of intervention – what level of conservation – what level of tree pruning – is actually necessary. And where it is necessary to introduce new materials – perhaps a pathway – into the cemetery, they must do their best to make certain these new elements are not only absolutely necessary, but also match the old elements in composition, design, color, and texture. In other words, if the cemetery has brick pathways, they would be failing as good stewards if they allowed concrete pathways – especially if the only justification was because concrete was less expensive.

Where conservation treatments are necessary, the Secretary of the Interior tells stewards that they must be the gentlest possible. However phrased – less is more – think smart, not strong – caregivers have an obligation to make certain that no harm comes to the resource while under their care. And again, one of the easiest ways to comply is to make certain that caregivers retain a conservator subscribing to the ethics and standards of the American Institute for Conservation.

Finally, the caregivers must also recognize that the cemetery is not just a collection of monuments and the associated landscape – the cemetery is also an archaeological resource. They must be constantly thinking about how their efforts – whether to repair a monument, put in a parking lot, or resurface a path – will affect the archaeological resources – archaeological resources that are the remains of people buried at the cemetery by their loved ones.

These are especially critical issues for both the white and black sections of the Old Jonesborough Cemetery. Modifications at the cemetery have taken place with no documentation, leaving caregivers guessing as to the nature of the work, the reason it was done, how it was conducted, and even who did the work. Original fabric has deteriorated from lack of care. Even the landscape has been

compromised by development activities on surrounding parcels and a lack of careful attention to critical management issues.

Our first recommendation, therefore, is that those assuming care for the cemetery, especially the Jonesborough City Council, become thoroughly familiar with the Secretary of the Interior's Standards for Preservation and reaffirm their responsibility as stewards of this historical resource to ensure that future preservation efforts are consistent with sound preservation principals and practices. These standards must become "talking-points" for all future discussions and decisions made concerning the graveyards.

The Cemetery, Its Setting, and Context

The cemetery is situated in Block 2022, Block Group 2, Census Tract 617, Washington County, Tennessee.

In 2007 the population for Jonesborough was 5,046, a 13.7% increase over the 2000 census. Jonesborough is a predominately white community (92.9%), with the African American population accounting for only 5.5% of the total. The median household income in Jonesborough is $38,744. The Tennessee average is $42,367. Over 19% of the residents had income below the poverty level in 2007 and the unemployment level (February 2009) is 7.7% compared to the statewide rate of 9.9%.

Historically, Jonesborough was a traditional, rural agricultural community dominated by single family homes; the demand for rental housing, however, has grown with the development of the area. In 2000, the census found 1,199 owner-occupied units (72.9%), with an additional 445 (27.1%) rental units. Today agricultural pursuits rank fourth, behind construction, health care, and education.

Nearly 76% of Jonesborough's population, 25 years or older, has graduated from high school although less than 19% have graduated from college.

While Tennessee has a relatively high crime rate – with all crime risk areas significantly above the national average, Jonesborough has a relatively low risk. For 2007 the total violent crime index was 198.6 per 100,000. Property crime, however, was 4,811.3, double the previous year, with larcenies making up the bulk of these statistics. This is significant since it indicates some potential for cemetery-related thefts.

The cemetery is situated at the eastern edge of town, south of Boone Street and north of East Main Street. The white and black sections are separated by a steep drainage, with two different entrances. The white cemetery is accessed by way of a drive off East Main Street, with a gated entrance. The African American cemetery is found to the east-northeast at the end of the paved Cemetery Street.

The white cemetery is bounded to the east by the entrance drive to The Carriage House Bed and Breakfast and to the south by a private residence. To the north is a steep bank down to commercial development along Boone Street. To the east is the drainage or gully that separates the African American and white cemetery sections. There is, however, a walking path that connects the two cemeteries, although the pathway is not developed and partially grown-up.

The African American section is bounded to the north by a small apartment complex and to the east and southeast by residential housing.

The topography in the white section is relatively level, with much of the cemetery on a high hill at an elevation of about 1,770 feet above mean sea level (AMSL), the African American cemetery is found at a lower elevation (about 1,750-1,760 feet AMSL and on more steeply sloping ground. There appears to have been a geographic differentiation between the two sections, reflecting the social divisions between the races.

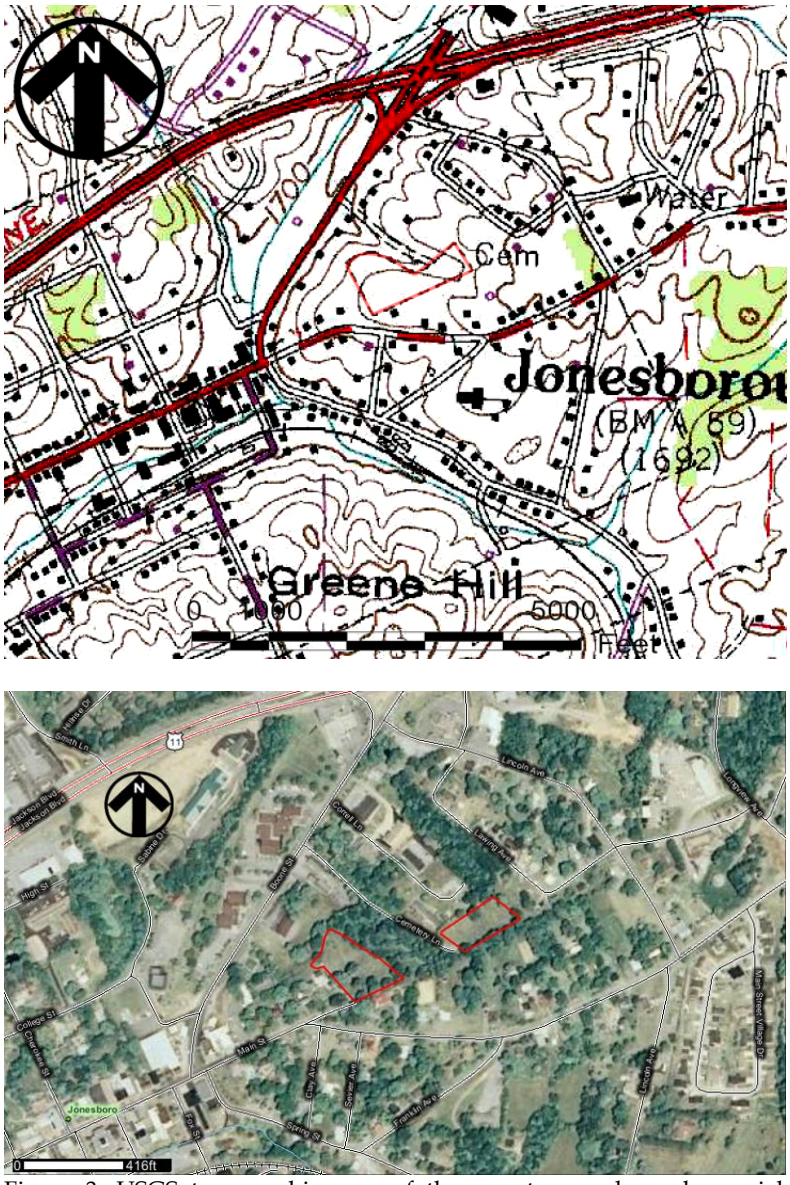

Figure 3. USGS topographic map of the cemetery and a color aerial photograph showing development around the cemetery (the western outline is the approximate limits of the white cemetery; the eastern outline shows the approximate limits of the African American section).

The entire cemetery consists of Dewey-Udorthents-Urban land complex soils. The Dewey soils are found on upland ridges and consist of deep, well drained clays derived from limestone or dolomite. Udorthents are cut and fill land and the Urban soils are mixed and disturbed by development.

The white section is thought to contain 2.71 acres, while the African American section contains 1.17 acres. There are about 400 marked graves in the white section, with documentation being provided by the 1995 and 1996 Governor's School for Tennessee Heritage (Anonymous 1996). We suspect that there are many graves in the cemetery that are not marked, so the total number of burials is likely far in excess of 400.

The sketch maps available from the documentation project show relatively organized rows that are organized northwest-southeast, with graves then oriented northeast-southwest.

There was originally at least one road bisecting the cemetery northwest-southeast, suggesting that there may have been an entrance through the property to the south of the cemetery. Today the remnants of this road can be traced between fenced plots – with the Dosser and Cunningham plots to the northeast and the Deaderick and Mahoney plots to the southwest. This drive appears to have been lined with maples, several of which are still present. Maples elsewhere in the cemetery suggest that additional drives may have been present, but this is not as clearly indicated as the original entranceway.

The white cemetery contains a large array of fenced plots and although the ironwork is in need of maintenance, the cemetery exhibits an excellent range of fencing types and manufacturers. While most of the monuments

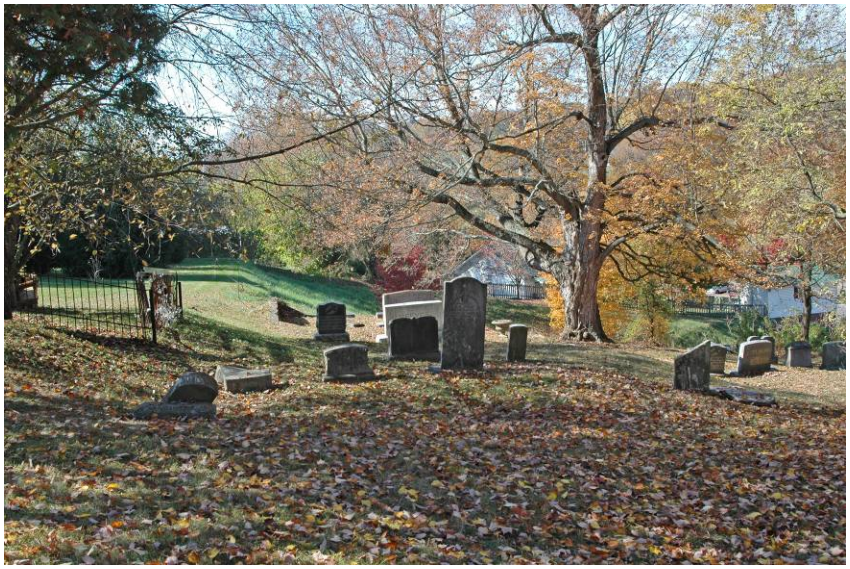

Figure 4. Top photos shows the old road through the center of the white cemetery with maples still present on the right-hand side. The bottom photo shows the north edge of the cemetery with terracing.

are headstones, there are a variety of other types, including obelisks, and pedestal tombs.

To the north the cemetery landscape begins to slope steeply toward Boone Street. The cemetery is terraced and the landscape takes on a different character.

The African American section remains undocumented. There are far fewer marked graves than in white section, although we suspect that this section is as heavily used. While African American cemeteries often lack the degree of organization found in Euro-American cemeteries, we were able to recognize at least 28 distinct rows in the cemetery. Monuments include a range of commercial markers, although fieldstones and concrete monuments are also very common. Perhaps most common in the section, however, are sunken graves – evidence of the very large number of unmarked graves.

Overall the white section remains relatively isolated from traffic. While there are two nearby residences, both unshielded, they appear to present a low visual impact on the cemetery and, at least during our visit, do not appear to offer a significant distraction.

The situation, however, is very different at the African American section. If it is accessed by way of Boone Street, the roadway has extensive commercial development and is busy. The road leading up to the cemetery passes by a small apartment complex that is intrusive and visually distracting. The African American section lacks the serenity and tranquility of the white section

Figure 5. South edge of the African American section showing a number of marked graves.

and this degrades the overall experience at this cemetery.

Factors Affecting the Landscape Character

Jonesborough is situated in what is called the Tennessee Valley and Ridge region – an area of numerous elongated ridges and intervening valleys, all trending in a northeast-southwest direction. Just miles to the southeast are the Blue Ridge Mountains, also known as the Unaka Mountains. The Tennessee River flows southwest through the Valley and Ridge region and streams generally follow narrow valley floors. The primary feeders of the Tennessee are the Clinch, French Broad, and Holston rivers. Just south of Jonesborough Cemetery is Little Limestone Creek, while to the north is Boones Creek.

The geology of the ridges includes rocks such as siltstone and sandstone. In contrast less resistant rocks such as limestone and poorly indurated shale are found in the valleys.

The Valley and Ridge section is characterized by the Oak-Chestnut Forest region. Ridge crests support such species as white and red oak, sour gum, sassafras, and chestnut. Lower mountain slopes contain mixed mesophytic communities of beech, white oak, and buckeye. Valley floors are dominated by white oak and occasionally tulip and hickory.

Jonesborough's weather is warm during the summer with temperatures in the 70s. The typical July high temperature is 85°F. Winter temperatures are cold, usually in the 30s, with the average January low being 23°F. Temperature variations between night and day tend to be moderate during summer with a difference that can reach 23°F, and moderate during winter with an average difference also of about 23°F.

The annual average precipitation at Jonesborough is 45.84 Inches. Rainfall is fairly evenly distributed throughout the year. The wettest month of the year is July with an average rainfall of 5.82 Inches.

Figure 6. Unmarked graves in the African American section of the cemetery.

Typically abundant precipitation is distributed fairly evenly throughout the year,

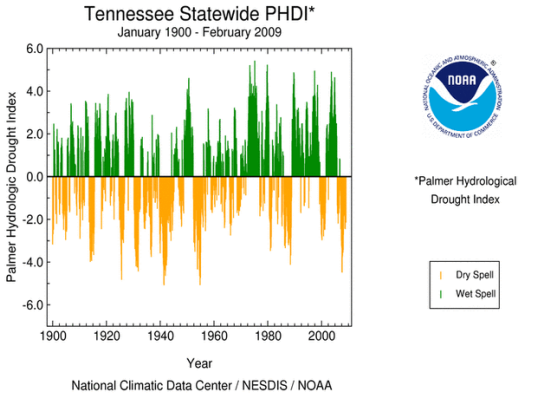

Figure 7. Drought index for Tennessee.

with an average annual precipitation of about 49 inches. Figure 7, however, reveals considerable potential for drought. A wet period that began in 2002 was replaced in 2005 by a prolonged period of low rainfall leading to severe drought conditions. In 2007 nearly three-quarters of the state was in a drought. Conditions have ameliorated and Washington County's drought has broken, at least temporarily. The crop moisture index actually indicates that the soils are abnormally wet.

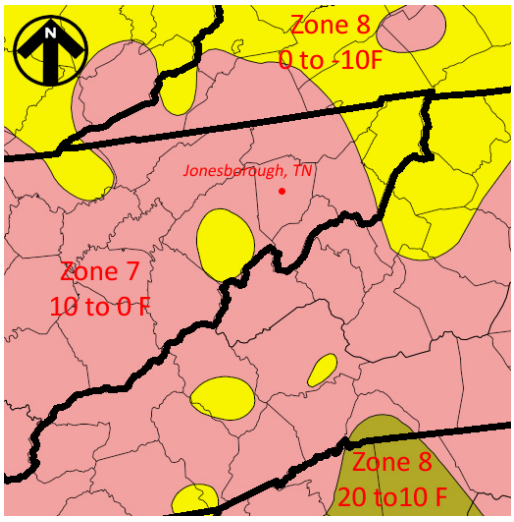

Figure 8. Plant hardiness zones in the vicinity of Jonesborough, TN.

The area has an average growing season of about 196 days, although this will vary by specific location, with low areas often evidencing late frosts. Figure 8 shows that Washington County, including Jonesborough, is situated in Plant Hardiness Zone 7, where the minimum temperatures are expected to be between 10 and 0°F. This is also an area where cool season grasses, such as zoysia, are typically successful.

A factor not only affecting the landscape, but also stone preservation is the level of pollutants. Based on monitoring in nearby Sullivan County, the annual mean of NO_2 is 0.01 ppm and the annual mean of SO_2 is 0.006 ppm. These levels result in significant levels of acid rain (see Figure 9) and deterioration of marble and many sandstones.

Administrative and Legal Issues

This section is not intended to offer legal advice – only to provide recommendations from the perspective of proactive cemetery preservation.

We are concerned that while the Town of Jonesborough provides maintenance to the African American section of the cemetery, it does not own the cemetery in fee simple. Thus, the town does not have any of the rights (or obligations) of ownership.

This will make it difficult – perhaps impossible – for the town to adequately and appropriately care for the property. It cannot establish rules of conduct, define or prosecute illegal or inappropriate activities, or – most significantly – regulate burial in this portion of the cemetery.

Moreover, there is the philosophical issue of whether a governmental entity ought to be spending public resources on caring for what are private resources.

We do not question that it is in the public's interest that the town assume control of the African American cemetery – but we very

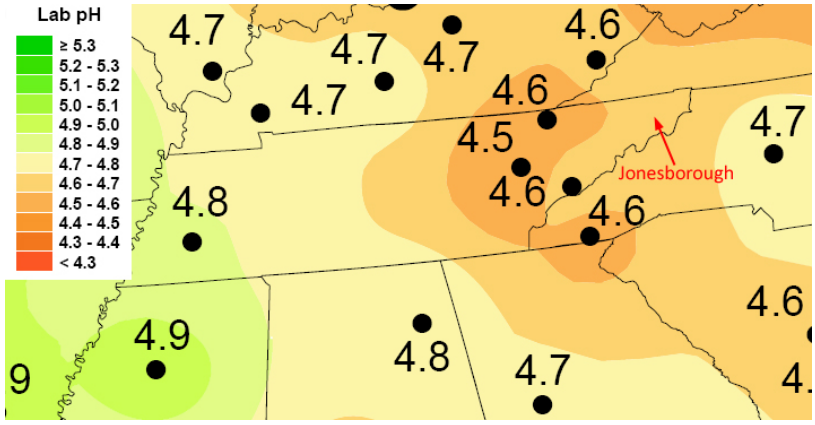

Figure 9. pH levels of acid rain across Tennessee (pH of 7 is neutral; lower than 7 is acidic; data is from the National Atmospheric Deposition Program, 2005).

strongly recommend that the town quit claim or take other action to acquire fee simple ownership of this tract. All of our following recommendations are predicated on the town having full and legal authority over the entire cemetery.

We also very strongly recommend that the town close both the white and black sections to any future burials, absent an individual providing a legal instrument certifying that they possess pre-existing burial rights. The primary reason for this is that the town exposes itself to considerable liability by operating a cemetery and – as will be mentioned below – the operation of a cemetery requires a substantial series of regulations and a staff familiar with mortuary practices.

In addition, the African American cemetery is clearly filled and there does not appear to be adequate room for additional burials without risking the disturbance of existing graves.

The Jonesborough Municipal Code includes only one mention of "cemetery." Section 2-206 prohibits the consumption of beer in cemeteries. While this section does not apply to other alcoholic beverages, Section 12-410 does prohibit the possession of alcoholic beverages in public areas.

There are no specific provisions concerning issues of trespass, hours open, appropriate behavior, damage to the monuments, or theft of cemetery items.

As a result, the town is poorly situated to provide appropriate protection to the cemetery.

Although we could not identify a comprehensive cemetery ordinance enacted by a city of identical size, nearby Johnson City does include one pertinent provision in its ordinances. For example, Section 11-128, Cemeteries; marking, defacing, etc., monuments, etc. states, "No person shall throw down, mark, deface or otherwise injure any monument or tombstone in any cemetery, or dig into or disturb any grave within any cemetery, or in any way injure any of the buildings or fences that may be erected for the benefit of any cemetery or burial ground."

Chattanooga's Citizen's Cemetery has been designated "Cemetery Park" and the ordinances covering its use are found in Section 25, Article II. Although not all are appropriate for the historic nature of the Old Jonesborough Cemetery, attention should be paid to the provisions dealing with control, regulations, and permits.

Provisions that we strongly recommend include:

- desecration of burial sites, monuments, fencing, and plantings;
- damaging cemetery property (e.g., "No person shall by driving upon, treading upon or otherwise mar the beauty of the ground, graves, growths or other property of the cemetery, nor in any way damage or destroy anything of

ornament or of value to the cemetery grounds.");
- limitations regarding installation of markers without prior approval (in order to maintain the historic appearance and integrity of the cemetery);
- hours open (typically set hours, such as 8am to 5pm); and
- an appropriate violation section establishing punishment

Finally, we recommend that the town adopt a flower policy that will minimize maintenance problems.

First, we believe that all flowers or arrangements should be removed by the town 10 days after holidays *or* when the arrangements become unsightly. This will allow staff to remove faded flowers, such as Christmas decorations after the holidays. Floral policies are common at cemeteries and what we propose is actually relatively simple and liberal.

Second, we recommend that only cut or live flowers be allowed. The most significant benefit of this approach is that such flowers can be readily mulched into the landscape, thereby significantly reducing the level of maintenance effort. Natural flowers are also far more appropriate and in-keeping with the historic nature of the cemeteries. In contrast, plastic flowers, if accidentally mowed, create significant debris that will not decompose.

Recommendations

The town should take the steps necessary to acquire fee-simple title to all of the cemeteries. This step is necessary to allow the preservation of the properties.

The town should modify its existing code to include specific provisions protecting the cemetery and making desecration a crime, prohibiting damage to the cemetery (distinct from desecration), establishing hours of operation, and requiring any modifications to be approved.

The town should close the cemetery to future burials, absent an individual producing a title to a specific, and open, plot.

All decisions regarding modifications, alterations, additions, or other actions affecting the town's cemetery should be carefully evaluated against the Secretary of the Interior's Standards for Preservation.

The remaining historic fabric and context of the cemetery should be protected.

HISTORIC SYNOPSIS

This assessment was not tasked with conducting additional research, so this account relies on a variety of primarily secondary sources supplemented by a few primary sources. While these discussions will assist the reader in placing the cemetery in a more secure historic and aerial context, its primary goal is to suggest areas that can be profitably researched in the future.

The County and Town

Northeastern Tennessee was settled by farmers from Virginia who traveled along the main streams, such as the Watauga, Holston, and Clinch. Where streams were too small for navigation, early towns were built in the uplands – such as Greeneville and Jonesborough. Where streams allowed navigation, communities grew up in the floodplains – such as Kingsport and Knoxville. While slavery was profitable in the larger valleys where larger farms were possible, the ridge and valley topography was generally unfavorable to the development of large land holdings – and the associated plantation life. In those areas smaller farms were the rule. The 1860 slave schedule for the Jonesborough District, for example, identifies only 82 enslaved African Americans.

Jonesborough is identified as the first town in Tennessee, being established by the NC legislature in 1779 as the county seat of Washington – the first county west of the mountains. To establish the town, 100 acres were purchased from David Hughes and the lots that were laid out were offered by lottery (cf. Anonymous 1887:897).

The first post office was established in 1796 and by about 1800 a postal route was begun, with the mail carried by horseback twice a week. By 1825 a stage line was added and in 1834 a stage passed through Jonesborough three times a week.

In that year the *Tennessee Gazetteer* reported the community had a population of about 500, with "eleven lawyers, four physicians, two clergymen, two churches, two academies, four schools, one printing office, four carpenters, three cabinet makers, two bricklayers, one blacksmith, four taverns, two hatters, four tailors, four shoemakers, one silversmith, two wagonmakers and one mill" (Morris and Rhea 1834). By the 1840s there was a significant building boom and many of the town's existing Federal style buildings were constructed.

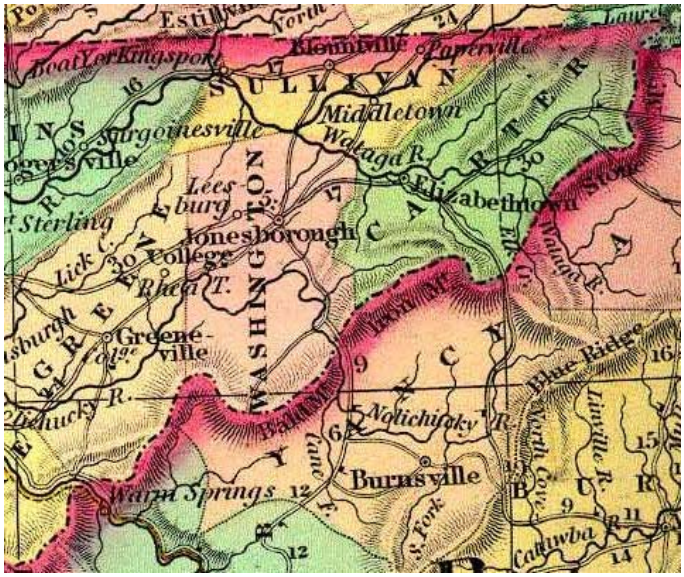

Figure 10. Portion of Tanner's 1834 Map of the U.S., showing Washington County in eastern Tennessee.

By 1854 Washington County was described as:

> The surface is finely diversified by mountains and valleys; the soil of the latter is highly productive, well watered, and much improved. Wheat, Indian corn, oats, and pork are the staples. Iron is exported from the mines of the county, which are very extensive. In 1850 it produced 395,742 bushels of corn; 201,568 of oats; 96,967 of wheat, and 151,030 pounds of butter. It contained 14 churches, 1 newspaper office, 1625 pupils attending public schools, and 250 attending academics and other schools. The streams furnish abundant water-power. It is traversed by the East Tennessee and Virginia railroad, unfinished. Washington county is among the oldest in the state, having been settled before the Revolution. Capital, Jonesborough. Population, 13,861, of whom 12,931 were free, and 930, slaves (Baldwin 1854:1237).

The town of Jonesborough was described in similarly glowing terms, being "situated in a highly productive and beautiful valley" and containing "2 or 3 churches, 2 academies, a good court house, and 3 or 4 newspaper offices" (Baldwin 1854:550).

The Old Jonesborough Cemetery

A one page synopsis of the cemetery's acquisition history or title search has been prepared by Jenny Parker and Gene Cox (n.d.). It indicates that the initial purchase of 0.35 acres occurred in 1803. This parcel was deeded to the Commissioners of the Town of Jonesborough by Patrick Long and was referred to as "the Old Grave Yard" (Washington County Register of Deeds, DB 9, pg. 191). This implies that Long may have been disposing of land that had been used as a cemetery since the founding of the community in 1779, 24 years earlier.

By 1849, John Blair, William K. Blair, and Robert L. Blair deeded an additional 2.12 acres to Seth J.W. Lucky, James Brown, and William G. Gammon, Trustees for $100.75 (Washington County Register of Deeds, DB 31, pg. 351; see Figure 11). The deed provides several important pieces of information. It notes that the trustees were selling cemetery lots in "fee simple" indicating that some individuals in the community may have deeds for family plots from the trustees. It also indicates that the trustees had already "caused the said piece of land to be fenced in so as to include the old burial ground" and then had "divided the remainder or the grater [sic] part there of into small lots some of which they have sold and others of which they design to sell as burial places as shown in the plat or drawing" (see Figure 12).

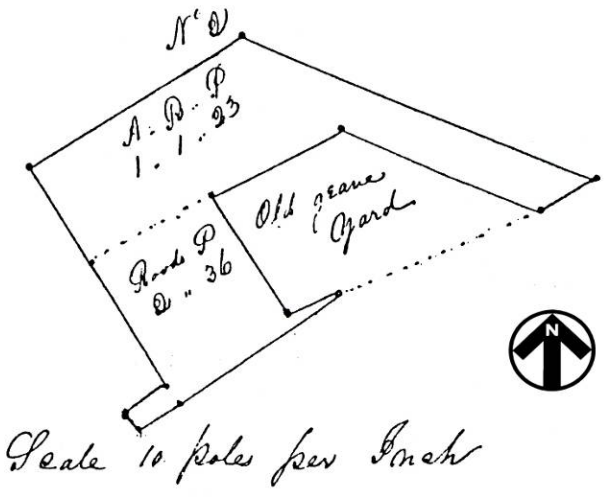

Figure 11. Plat showing the original 1803 "Old Grave Yard" and the 1849 addition.

The 1850 census identified Luckey as a judge with real estate valued at $4,500. Brown was a saddler with $2,100 in real estate. Gammon was listed as a trader (distinct from merchant?) with real estate

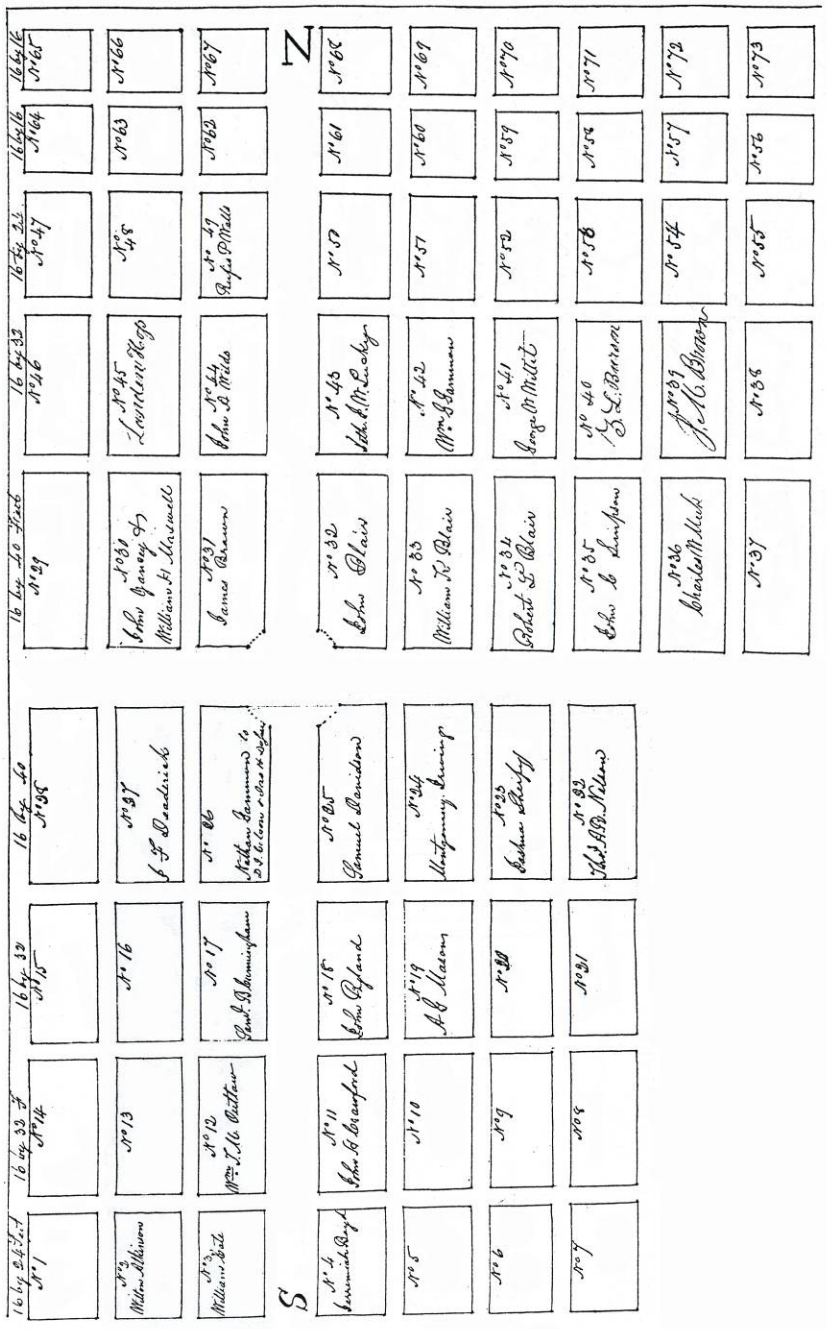

Figure 12. Layout of a portion of the 1849 addition to the cemetery.

valued at $2,000.

It is not entirely clear how the new plots fit into the drawing showing both the old and new acquisition since the shape does not correspond with the drawing of the new plots.

It is, however, possible to place the plat of the new plots in the cemetery since several of the named plots can be identified on the ground. The central circle is also still recognizable and the north-south road is still lined with maples. It would be useful to overlay the plan with a map of the cemetery, although no such map is currently available.

It appears that the "old grave yard" is that portion today found on the eastern edge of the cemetery, toward the African American cemetery. The long strip shown on the plot might represent the gully area that separates the two burial grounds, but this would need to be confirmed through survey.

The plot plan reveals that the trustees recognized the need for several plot sizes – so they offered sizes 16 feet square (256 ft²), 16 by 25 feet (400 ft²), 16 by 32 feet (512 ft²), and 16 by 40 feet (640 ft²). These would allow for the burial of 8 to 20 individuals each.

Parker and Cox (n.d.) note that another deed, also dating from 1849, disposed of a 15

foot strip of land along the western side of the cemetery, apparently to allow ingress and egress. This may represent the parcel used for the road to The Carriage House today (Washington County Register of Deeds, DB 32, pg. 46).

A second addition to the cemetery occurred in 1899, with the addition of approximately 0.28 acres, reflecting the northwestern extension of the cemetery. This addition allowed for 28 additional lots (three rows of nine lots), each measuring 18 by 25 feet (Washington County Register of Deeds, DB 76, pg. 320). These lots were numbered 45 to 71 – duplicating lot numbers assigned in the 1849 deed.

There are numerous questions left unanswered by this brief account. For example, while the initial cemetery was devised to the town, the subsequent addition was sold to trustees. Are these trustees associated with the town or was this portion of the cemetery a commercial venture? Since the deeds were to be in fee simple, can additional deeds be found in the Washington County records? Are there any town records that might provide information on the activities in the "old" graveyard? Are there newspapers that might have obituaries listing burials in the new (or old) cemetery?

Parker and Cox (n.d.) provide no information on the grantee or grantor for the final expansion of the cemetery. It would be useful to know if trustees opened this new section and if they were the same individuals identified in the 1849 deed. It would also be useful to determine how the new lots relate to those previously established.

The African American Cemetery

Parker and Cox (n.d.) also provide basic information for the African American section, noting that in 1890 two parcels were sold to the "Trustees of the Colored Peoples Cemetery Society." One tract was granted by R.M. May and contained about 0.8 acre. Rufus M. May is listed in the 1900 census as a merchant living in Jonesborough.

The second parcel was granted by W.H. Correll "with concurrence" of T.H. Reeves and contained about 0.37 acres. This parcel adjoined both May's and the "Old Grave Yard," probably meaning the white cemetery, although the 1849 acquisition buffered the "Old Grave Yard" with a strip 30 to 70 feet wide. Reeves is not listed in the 1900 census, although William H. Correll is listed as a 55 year old sawyer living in Jonesborough. A Thomas H. Reeves is found in the 1880 census, where he is reported to be a 37 year old farmer living in Jonesborough.

These deeds leave a variety of unanswered questions. Parker and Cox (n.d.) state the most obvious – where were African Americans buried prior to 1890; but there are others. For example, who were the citizens that formed the Colored Peoples Cemetery Society? Can anything further be identified about the group, perhaps through newspaper accounts? What were these tracts being used for prior to their acquisition by the society (is it possible that there was already an African American cemetery at this location)? How were the early twentieth century African American burials conducted in the Jonesborough area? Were there African American undertakers (and if so, are any records surviving)?

Another approach would be to identify death certificates for those in the cemetery to determine the name(s) the cemetery operated under and the undertakers that buried there. For example, we have identified that there is a death certificate for John Rhea, who died June 18, 1923 (the stone identified the month as July), in vol. 61, pg. 458.

Recommendations

There remain a very large number of questions surrounding both the white and black cemeteries. The current historic research has

barely scratched the surface. Additional research would begin to place the cemeteries in a more secure historical context. This research could be tied into the development of mortuary practices in Jonesborough and the study of the African American cemetery would be of special interest considering the town's importance in the abolitionist movement.

All of the historic research can be used to generate better interpretative information for the city's web site, and tourist brochures. It is also critical in order to evaluate the National Register potential of the cemeteries or their contribution to the expansion of the existing historic district.

ROAD AND PEDESTRIAN ISSUES

Access and Circulation

Access to the white section is by way of Main Street, with an inconspicuous cut off leading to the gates of the cemetery. Running off this access road is another road leading to The Carriage House Bed and Breakfast.

The 1849 deed references that one line follows Main Street and the subsequent 1849 conveyance gave up a strip of land that may represent the access road to The Carriage House. Thus, the arrangement we see today has some historical roots, although it appears that Main Street has been shifted southward, away from the cemetery.

Today Main Street curves at the entrance to the cemetery, creating a hazard to those attempting to enter the cemetery from the west. Although the access road allows two-way traffic, there is a bottleneck at the cemetery. Once at the cemetery gates, there is no available parking area, except within the cemetery. This limits vehicular access.

Exiting the cemetery may prove equally difficult for many drivers, since it requires backing out into The Carriage House drive to allow exiting the cemetery proper. At the intersection with Main Street the existing curve can make entrance into traffic difficult.

Today there is no circulation within the cemetery. While narrow roads may have been present at one time, they no longer exist and their locations are obscure in most areas. It is also unlikely that they were ever meant for anything more than a horse drawn hearse and pedestrian traffic.

The existing arrangement limits what can be done to improve vehicular access. There are no convenient locations for parking and any effort to create parking would be intrusive, disturbing the quiet, residential nature of the surroundings.

This means that any effort to incorporate the cemetery into the town's heritage tourism efforts will need to rely on pedestrian access (discussed below) or else small tour buses that can navigate the narrow access road.

The access road is also beginning to show deterioration and requires maintenance prior to significant potholing.

We do recommend efforts to improve the safety of entering and exiting the cemetery by lowering the speed limit in this section of Main Street and better marking the cemetery access. We also recommend that the town undertake a traffic study of this particular location to determine if other measures may be appropriate.

The situation at the African American section is hardly better. Vehicular access to this cemetery is by way of Cemetery Lane, off Boone Street. Boone leads from Main to Jackson Blvd (U.S. 11) – a very busy highway. As a result, traffic on Boone can, at times, be congested, making the turn difficult if the driver is unfamiliar with the area.

Cemetery Lane is also a one-lane road. The main users are the occupants of a small apartment complex that is adjacent to the cemetery at the top of the hill. The road dead ends at the cemetery and, as with the white section, there is no convenient parking. In addition, the bulk of the cemetery is upslope from the road, making access difficult for the elderly once parked and out of their vehicle.

Figure 13. Cemetery access issues. The top photo shows the access to the white cemetery off main. The bottom photo shows the access to the African American cemetery off Boone Street. Both present significant limitations for vehicular visitation.

Figure 14. Pedestrian access issues at the cemeteries. The top photo illustrates the end of the sidewalk prior to the cemetery off East Main Street. The bottom photo shows the end of Cemetery Lane with the pathway to the white cemetery section to the left side of the photo.

There is, however, more space for the creation of parking at this location than there is at the cemetery off Main Street. Consideration should be given to creating a three or four car parking area by expanding the road terminus, perhaps by cutting into the slope to the southwest. A planted retaining wall could be created, enhancing the appearance of the parking area. A pedestrian pathway could then be created to allow convenient access between both cemeteries (discussed below).

Figure 15. View from the old section of the white cemetery toward the African American section, showing proximity.

Pedestrian Access, Sidewalks and Pathways

Jonesborough is in the process of creating what is known as the Lost State Scenic Walkway. This pedestrian path is intended to connect one side of town to the other using Little Limestone Creek, which flows from one side of town to the other, for a major portion of the corridor. The design schematic we were shown, however, does show a loop that comes off the creek on the east side of town following Sabin Drive to Main, bringing it in close proximity to the cemeteries.

If completed, this design is excellent since it would allow the cemeteries to be incorporated in an overall heritage tourism program and provide walking access. It would, as the town states, allow "residents to walk in a safe and comfortable setting away from vehicular traffic."

This is a particularly critical issue since at present the sidewalk along Main Street terminates prior to the cemetery at a series of steps. Much of this sidewalk is not ADA compliant, including telephone poles and other obstacles.

There is a sidewalk along Boone Street, although it is on the side opposite Cemetery Lane. It provides little assistance in reaching the African American cemetery.

Neither cemetery has any recognizable pathways or walks. Pedestrian traffic at present is so light that this is not a problem – there is no evidence of worn grass or erosional areas. At the present time we do not recommend any formalized pathways – they would not have been present historically and would be intrusive into the landscape.

Access between the two cemetery sections is problematical. There is a pathway, although it is heavily overgrown and would be difficult to navigate by the elderly. On the other hand, it would be very easy to create a pleasant and safe landscaped walk between the two areas with very little cost. In fact, it could even be a civic project.

Universal Access

The lack of suitable pathways and steep slopes are the most limiting factors for ADA compliance or universal access at the cemeteries. Any extensive modifications would be out of

character. In addition, it seems appropriate to make such modifications only if there is a clearly documented need. We are not certain that there is a demand adequate to justify either the expense or the damage to the historic fabric.

In addition, the ADA or the Rehabilitation Act of 1973 is generally not interpreted to apply to cemeteries by the Department of Justice. Nevertheless, we are an aging population and it would be appropriate for the town to establish a protocol that would allow staff to assist wheelchair patrons or other disabled reach specific gravesites in the cemetery. Some cemeteries have achieved this goal by training their staff in the correct means of assisting the disabled[1] and by providing golf carts to help ferry individuals to grave locations. This should be a long-term goal of the town for these properties.

Another low impact approach suitable for tourism is to ensure that there are interpretative plaques and exhibits at the entrance to the two cemetery sections – allowing disabled visitors to experience and learn about the cemeteries.

Recommendations

The town should consider options for making the entrance and exit off Main Street safer and more convenient.

Consideration should be given to improving the parking at the African American cemetery, where there are more options for expansion. This would provide parking access for both cemeteries.

We strongly recommend that the two cemeteries be linked by a formal, but rustic pathway.

Neither cemetery warrants the creation of pathways. They did not exist historically and their creation today would cause extensive damage to the historic fabric and context of the properties.

The town should establish a protocol for assisting disabled clients and visitors. This should include appropriate training of staff and a means to provide access to remote graves.

[1] Sites for establishing such protocols include http://www.apparelyzed.com/etiquette.html, http://www.afb.org/Section.asp?SectionID=36&TopicID=163&DocumentID=2104, and http://www.aheadweb.org/wiki/DeafEtiquette.

LIGHTING AND SECURITY ISSUES

Vandalism

Caregivers report that they are unaware of vandalism in either cemetery, yet during this assessment some signs of malicious acts were found in both. In the white section we found recently broken stones (evidenced by the marble still being crisply white) and toppled stones (too heavy to have fallen accidentally). In the African American section several stones had been used as targets for paintballs. Thus it is likely that both cemeteries have been – and will continue to be – targets of vandalism.

Neither cemetery is fenced in any meaningful way and there is ready access. While the African American cemetery is generally open, allowing for ready identification of persons on the property, the white cemetery is far less open. There are numerous fenced plots, large stones, clumps of vegetation, and large trees – making it difficult to determine if someone is in the cemetery. In addition, immediately adjacent to the cemetery on the south there is a dilapidated building on an adjacent parcel that could provide a hiding place.

At the present time there is no systematic inspection process – either by the local police or by a caregiver group. Neither cemetery is situated on a major road. However, the cemetery's location also provides some protection since it is not possible to drive vehicles into the cemetery proper.

Although Jonesborough is a small town, it does have a real risk of property crime and, as previously noted, the property crime rate has recently risen. In 2006, Jonesborough had 15 full-time police officers – yielding 3.3 officers per 1,000 residents. This was above the national average of 3.0 per 1,000.

It will be difficult to ascertain the level of damage the cemetery suffers without some method of periodic inspection. Neither section receives consistent public visitation, so it will be important for the town to develop inspection procedures.

This inspection process can be integrated with other maintenance activities, such as trash collection, collection of downed limbs, or other such activities. The inspections should occur weekly and should be documented. The individual doing the inspection should be familiar with the cemetery and thus able to recognize damage that is not pre-existing.

We also recommend that a group such as The Heritage Alliance attempt to create a friends group that can provide additional eyes on the cemetery. Volunteers could stop by each section on weekends and especially on holidays.

Adjacent property owners to both sections should be contacted and requested to keep an eye out for any suspicious activities. Although many neighbors likely work during the day, they can provide valuable allies during nights and weekends.

These steps will help maximize the attention that the cemetery receives. Coupled with other recommendations offered by this study, it will further reduce the risk of significant vandalism.

We recommend that the town develop a form designed for the reporting of cemetery-

Figure 16. Security issues at the cemetery. The top photo shows two stones in the African American cemetery vandalized with paint balls. The middle left photo shows a stone toppled in the white section. The middle right photo shows the light on the edge of the cemetery property. The lower two photos show gates that should be secured to prevent theft.

specific vandalism. This form should include several items:

- What was damaged, with specific information concerning each stone, including the name and lot/plot?
- How was the stone damaged (toppled, broken into how many fragments, scratched, etc.)?
- Where is the stone now (was the broken stone gathered up for storage, if so, where is it stored)?
- An estimate of when the damage occurred. This should routinely include the last time the stone was known to be undamaged.
- An estimate – from a conservator – of the extent of the damage and cost for repair.
- A photograph of the damaged stone.
- When police were notified.
- When police responded and took a report.
- The outcome of the police investigation.

An example of one such form can be found at http://chicora.org/pdfs/Vandalism%20Form.pdf.

It is critical that the town report each and every case of vandalism, regardless of extent, to the police. The police must be educated concerning the historic value of these stones and the financial cost of the damage to ensure that damage and vandalism is taken seriously. If the damage is recent, the police should be expected to assign crime scene investigators to collect evidence. This evidence may include shoe prints in soil or on stones, discarded beverage containers with finger prints, collection of evidence such as cigarettes, and collection of any eye witness accounts. The police should be expected to assign an investigator and this individual should be expected to treat this as a real crime deserving of real investigatory efforts.

These inspections, however, are not intended to take the place of routine police patrols. A police presence can be a major deterrent to cemetery-related crimes.

Given the absence of roads into the cemetery, we acknowledge that they will be limited. Nevertheless, the act of police driving up the access road or driving to the end of Cemetery Lane at night and shining their spotlight in the cemetery will have a positive benefit. This can be maximized by having police park in these access points to do paperwork or while waiting for calls.

Patrols are especially important at night – and especially on long weekends and holidays when alcohol consumption increases. Halloween is a particularly common time for cemetery vandalism.

Cemetery Lighting

Lighting is sometimes seen as reducing vandalism. There are two problems with this approach. The first is that cemeteries were not lighted historically. Thus, the introduction of lighting detracts from the historical integrity of the properties, changing the historic fabric. The second problem is that lighting is only useful if there is someone guarding the property, using the lighting to identify problems. This is not the case in most cemeteries, including the cemetery in Jonesborough.

Each section has a light – one at the white cemetery on the fence line at the south, near the entrance and one in the African American cemetery at the end of Cemetery Lane.

We do not recommend that any additional lighting be installed.

Hardening Targets

Thefts in cemeteries nationwide have dramatically increased. The reasons for this are two-fold. First, there is an increasing market for gates, urns, ironwork, and statuary – created by an increase in upscale garden design and individuals willing to pay large sums for original artwork. Second, there is less attention being paid to cemetery fixtures, largely the result of decreased maintenance budgets and fewer police patrols.

Both cemetery sections contain ironwork and the white section has a number of nearly intact fences, many with unsecured gates. One gate is simply leaning against a fence.

It is a simple maintenance step to use woven stainless steel wire to secure gates to their hinge posts. This allows the gate to open and close, but makes it considerably more difficult to lift the gate off its hinges and steal it. The cost is less than $20 and the time involved is about 15 minutes. This is something that the town's maintenance staff can easily accomplish or that would be an excellent community project. See the NPS article, http://crm.cr.nps.gov/archive/25-02/25-2-15 .pdf for additional information.

Fragmentary stones will be discussed in greater detail in a following section, but it is important that damage be repaired to prevent loose items from being readily available to thieves or souvenir seekers.

Recommendations

Arrangements should be made to ensure that both cemetery sections are inspected at least weekly. This may be done during routine maintenance.

The town should develop a policy and form for identifying, reporting, and responding to damage, vandalism, and theft at the cemetery.

The town should work to ensure that there are routine police patrols at least to the entrance of both cemetery sections. Police should also be encouraged to park at the cemeteries while doing paperwork to maximize their presence.

The neighbors adjacent to the two sections should be contacted with the request to report any activities at the cemetery to the police.

All plot gates should be secured using woven stainless steel wire, attaching the gate to its hinge post.

Maintenance should be improved to prevent items from being easily picked up and removed from the cemeteries.

CEMETERY FIXTURES AND FURNISHINGS

Plot Furnishings

The only plot furnishings we observed were three concrete benches in the white cemetery and several concrete urns. These are relatively modern objects and while deserving of retention, they do not require any special care.

Plot Fences

There are a number of plots in the cemetery that retain some or all of their historic ironwork – two in African American section and seven in the white section. These are significant resources, characteristic of the Rural Cemetery Movement (although found in a town cemetery) and are critical components of the cemetery landscape. Consequently, they deserve special care and attention.

Three different manufacturers are identified using shields on the gates. In the white section are fences from Valley Forge and Reeder & Groff. In the African American section are fences from Stewart Iron Works and Valley Forge.

The Valley Forge fences appear to be the most common. This is not surprising since the firm, begun in 1873, was located in Knoxville. It ceased operation ca. 1903, indicating that these fences were purchased and set during a relatively narrow window of 30 years. The Stewart Iron Works was one of the largest manufacturers of iron fencing found in cemeteries. It began in 1886 in Covington, Kentucky and is still in business today. Unfortunately, we have been unable to identify the Reeder & Goff works, although the fence indicates that they were located in Philadelphia.

These fences, however, are in various states of deterioration and several require immediate attention. Problems include the collapse of coping and fence supports, corrosion and failure of various anchoring materials, failure of section connectors on line and corner posts, incorrect previous repairs, and failure of coatings leading to extensive corrosion. In spite of these problems, all of the fences can be rehabilitated, ensuring that they continue to contribute to the cemetery landscape.

There were several fences (see, for example, Figure 16) where fence parts have been allowed to lay in or around the plot. This invites theft or souvenir collecting, resulting in the loss of historic fabric. The town should collect, label, and store all such individual parts until such time as repairs can be made – the individual parts should never be allowed to remain loose in or around the plots. Alternatively, it would be acceptable to use woven stainless steel wire to attach the parts discreetly to their respective fences – securing the parts on-site.

While repairs are needed, the primary recommendation is that the fences be painted – this will improve their appearance and will reduce future conservation problems.

Absent historic documentation that suggests otherwise, flat or semi-gloss black is typically an appropriate fence color. Gloss paint should be avoided since the glossing agents reduce the lifespan of the coating.

The best approach to historic ironwork is minimal wire brushing to release obvious scale and corrosion, then the use of a rust converter as a primer. Of the three that were successfully tested by the Canadian Conservation Institute, Rust-Oleum's Rust

Figure 17. Plot fence issues. Upper left photo shows a gate that should be reset on its hinges and secured with woven stainless steel. Vegetation on the fence should be removed. Upper right photo shows where the top rail should be caulked to prevent water intrusion and corrosion. Middle left photo shows extensive corrosion damage to a line post set in stone using lead. Middle right photo shows fence damage caused by tree growth. Lower left photo shows displacement of coping blocks and damage to fence sections, probably caused by tree limbs. Lower right photo shows panels no longer being held in place by post placement; wire has been used unsuccessfully. Note also the failing coating on the mild steel.

Reformer is the least expensive and most readily available (it is available, for example, from Grainger's Industrial Supply for about $80/gallon). We recommend one coat of the Rust Reformer. This can be applied over stable corrosion and the product does an excellent job of converting the corrosion into a stable base for a top coat of alkyd paint.

Following the Rust Reformer we recommend a first coat of flat white. If coverage is not complete, the Rust Reformer will show through this white paint, providing a visual indicator that additional work is necessary.

Next should be the top coat of flat or semi-gloss black. The white undercoat will immediately reveal any area where the black top coat has failed to provide adequate coverage. The use of these alternating colors helps ensure thorough coverage. The paint coatings should not be applied thickly, as thick coats hide detail, cure poorly, and will often prematurely fail.

Generally painting should be by brush – if sprayers are used all nearby monuments must be carefully wrapped in tarps to prevent overspray.

For those fences with failing coatings the use of Rust Reformer is not possible (it must be applied over stable corrosion). In these cases consideration should be given to the use of abrasive cleaning using 30-80 mesh garnet grit. The abrasive cleaning should be taken to clean grey metal, at least equivalent to a Near White Blast as defined by SSPC Specification SP 10 or NACE 2. No more should be cleaned in a single day than can painted that same day, using one coat of primer and two top coats.

Corrosion does not occur solely on visible surfaces; it will also occur in hidden areas, especially joints where moisture is drawn in through capillary action. As a result, all fences should be carefully caulked with a paintable elastomeric caulk. An example of one such product is Sikaflex.

This maintenance program will significantly improve the appearance of the ironwork and will help prevent additional corrosion and deterioration of the various fence components.

As illustrated by Figure 17 there are additional concerns that cannot be addressed simply through maintenance painting.

In one case a tree is seriously impacting the fence. The ideal solution is to prevent this type of tree vs. fence conflict by carefully maintaining the landscape and removing small problems before they become large. However, in this case the tree is likely a historic specimen. Its health should be evaluated by a certified arborist and a decision made on whether the tree will be removed and the fence reset or to sacrifice the fence section until such time as the tree requires replacement. At that time the ironwork can be cut from the tree and carefully straightened to allow for resetting.

Another common problem is for joints to no longer be intact. The town should resist the temptation to repair such problems using welding. These fence connections typically used slip joints that allowed free expansion and contraction of the metal work. Welding eliminates this ability to move and results in additional, more serious, problems.

Welding, if performed using continuous (not spot) welds that are ground smooth, is acceptable where little or no expansion or contraction of the iron is anticipated. The goal of professional welding should be to prevent the repair from being visible. Welding cast iron, however, is a very specialized undertaking and should not be conducted unless the individual is highly skilled in that particular area.

There are some posts that are heavily corroded where they have been set in granite blocks using lead. Although this is a "traditional" technique, the lead shrinks back from the iron, allowing moisture to enter the

joint and begin the process of corrosion. Coupled with inadequate maintenance, significant damage to the stability of the fence will occur. Often it is necessary to refabricate and replace posts that have been seriously compromised. It is, however, sometimes possible to replace the lost fabric with a metal epoxy. The repair should be ground smooth and painted.

Finally, replacement of missing parts should seek to use noncorrosive material, such as stainless steel. Where this is not possible, it is critical that the fences be consistently painted.

Where only decorative elements are missing, such as finials, it is often better not to attempt their replacement. Parts can be recast, but this is an expensive process and is usually not the most critical preservation issue facing a cemetery.

Boundary Fence

A boundary fence is found on two sides of the white section. Beginning at the gate, there is about 182 feet of fence along the south side. From the gate a fence extends north along the west side about 227 feet (357 running feet).

The source and dating of this fence is, however, problematical. The design along both sides is similar – hairpin and picket. However, along the south the pickets are 5-inches on center, while on the west side they are 4¾-inches on center. The southern fence has sharp, four-sided points, while on the west the points are milled. These are two different fences that have been erected along partial borders of the cemetery. The fence on the south also lacks connectors, suggesting that it was salvaged.

The problems faced by this fence are not different from those described for the plot fences. The single best preservation approach is to ensure that this boundary fence is painted.

Copings and Walls

The cemetery's rolling topography and terraced north slope has resulted in a small number of plots with retaining walls. Most are in good condition. One, however, has failed. While graves are not endangered, the damaged wall detracts from the landscape and gives a run-down appearance. We recommend that it be included in repair plans.

Recommendations

The town should immediately implement – or fund – a maintenance program for the iron work in the cemetery that consists – minimally – of securing the gates and painting both plot fences and the boundary fence. Long-range, the town should fund a conservation program for the fences.

Loose ironwork at the cemetery should either be collected, labeled by plot, and stored securely or should – at a minimum – be secured to other ironwork on the plot using woven stainless steel wire.

The town should be very careful about introducing amenities, such as benches, into the cemetery. They are often misused and frequently the target of vandals.

The one plot wall that has failed should be removed and replaced in-kind.

LANDSCAPE MAINTENANCE

Staffing

The cemetery's two sections consisting of about 3.88 acres are cared for by the Town's Park and Recreation Department. The crew responsible for these cemeteries consists of one individual and a supervisor. They perform maintenance in the white section. In the African American section we understand that county inmates are used for maintenance activities. The cemeteries, however, are not their only obligation and, in fact, represent only a nominal amount of their daily activities. No training is provided by the town in OSHA/health/safety, equipment, landscape maintenance, or cemetery related issues.

Level of Staffing

We typically recommend two workers and one supervisor per 10 acres. This is based on the Boston Historic Burying Grounds Initiative (Atwood et al. 1989) and is particularly suitable since it is estimated that mowing old cemeteries with 3-dimensional monuments requires six-times the labor than modern lawn park cemeteries (Klupar 1962:239; Llewellyn 1998:100).

Thus, for the approximately 4 acres of cemetery, we would recommend a full-time staff of one person, with supplemental assistance during the growing season.

The existing staffing level is low since it does not reflect full-time attention and affects the ability of the town to have an adequate presence in the cemetery, perform the necessary maintenance, and help ensure the long-term viability of the cemetery sections. A higher level of staffing would also help minimize vandalism and inappropriate activities in the cemeteries.

Appropriate maintenance established by good practice includes weed control, tree trimming, pruning, seasonal cleanup, conducting section inspections, survey of monuments for maintenance needs, maintenance of shrub beds (of which there are very few), rehabilitation of barren areas, raking, resetting stones as needed, inspecting and repairing fences, watering newly planted areas, sodding as necessary, identification of trees for removal, removal of flowers and grave decorations, and removal of wild growth (see, for example, Klupar 1962:226-228). The importance of maintenance was clearly stated by West, "one thing is certain, the cemetery must be maintained in a proper manner or public confidence will suffer" (West 1917:26).

This full-time individual, responsible only to the cemeteries, would also allow the town to train this employee in the appropriate way to reset monuments, as well as make simple repairs. It would be possible to undertake, for example, an appropriate level of fence maintenance. It is important that this employee be assigned exclusively to the cemeteries, allowing the individual to develop a sense of ownership and continuity.

In addition to these maintenance efforts, efficient cemetery operation also depends on management activities that Llewellyn describes as ranging from "land use (master planning), road maintenance, utility operation (backbone utilities like water), budget balancing (sales to cover expenses), long-term financial concerns, community relations, enforcement of rules and regulations, and so on" (Llewellyn 1998:206). In fact, he spends an entire chapter on administrative responsibilities of the cemetery manager. These functions, of course, are significantly reduced if the town, as we

recommend, eliminates future burials from these two cemetery sections.

Consequently, the town must provide a staffing level that will maintain the beauty, dignity, and historical significance of the Jonesborough properties.

Staff Training

Sadly, professional training in the landscape industry, at least among the public, is undervalued. This contributes to rapid turn-over and inappropriate maintenance activities.

In a small town or cemetery setting it is often difficult to have a certified arborist on the cemetery staff. We do, however, understand that the town has a certified arborist (Mr. Patrick McCammon).

Certified arborists have a minimum of three years experience in some aspect of tree care and have passed an exam developed by an international panel of experts. The exam extensively covers every aspect of tree care and the individuals must have an acceptable level of knowledge in all areas of arboriculture.

Given the large number of trees in the white section, the importance of these trees to the vistas and historic landscapes, and the potential damage that improper tree care can create, it is critical that the cemetery make use of this individual. Tree needs will be discussed in a following section.

Traditionally park and recreation departments have focused on issues such as turfgrass at athletic facilities or public parks. It would be a mistake, however, to assume that the problems of grass growing are the same, regardless of where the turf is situated.

An excellent publication on cemetery lawns notes that, "there are peculiar problems which confront only the person responsible for the development and care of cemetery lawns." These include the age of cemetery grounds and the fact that rarely were cemetery choices made on the basis of appropriate soils (Anonymous 1932:4).

In 2005 the Associated Landscape Contractors of America (ALCA) and the Professional Lawn Care Association of America (PLCAA) merged to form the Professional Landcare Network (PLANET). This organization offers three certification programs.

The first is the Certified Landscape Technician – Exterior. The exam for this certification is a hands-on field test and candidates can be tested in Installation, Maintenance, or Irrigation.

The second is Certified Turfgrass Professional – a comprehensive study of both warm and cool-season turfgrasses developed by the University of Georgia Center for Continuing Education. Certification in this area demonstrates a mastery of weed, insect and disease identification/control, as well as diagnosis of common turfgrass problems. The material supports Integrated Pest Management concepts and pesticide safety – significantly reducing the City's liability for operations.

The third is Certified Ornamental Landscape Professional. This certification emphasizes tree and shrub maintenance procedures with candidates concentrating on landscape trees and ornamental woody plant physiology, health care management, and establishment.

While there is a statewide organization, the Tennessee Nursery and Landscape Association, they do not offer certification opportunities. We have identified three Tennessee resources, Southwest Tennessee Community College, Landscape and Turfgrass Management (Memphis), Chattanooga State Landscape and Turf Management (Chattanooga), and Tennessee Tech University, School of Agriculture, Turf Management

(Cookeville). Unfortunately, none are in the immediate vicinity of Jonesborough. However, the Tennessee Master Gardener program for Washington County is operated by the Washington County Extension Service and this program also includes very valuable information and involves only 40 hours of training, typically at the local level.

The town should provide opportunities for its staff to become certified in different areas. Such efforts would improve the level of care and maintenance and develop a greater sense of stewardship.

Continuity of the Staff

Maintaining the continuity of a maintenance staff with a commitment to the preservation of a historic cemetery is critical. It not only serves to help ensure the highest possible quality of care, but also allows the specialized knowledge that accrues to be transferred to new staff members over time.

Obtaining this continuity, of course, demands that the city provide a reasonable pay scale for new workers and ensure that staff do not feel trapped in a dead-end job.

The Use of Prisoners

Regardless of the credentials or certification, the complexities of cemeteries require that those performing the work are not only trained, but also well supervised and are held accountable for their performance.

This becomes difficult when prisoners are used. There is little, if any, sense of pride and no sense of ownership. There is no continuity from season to season. As a result overall performance – and appearance – suffers.

The town would do well to eliminate the use of prisoners for cemetery maintenance and, instead, rely on trained and paid staff. If this cannot or will not be done, then it is essential that the prison crews be given careful and detailed instructions, that these instructions be repeated every time they arrive for work, and that the town have the right to dismiss any prisoner not performing their task appropriately. It is essential that prisoners be supervised by a trained individual their entire time on site.

Cemetery Trees

Selection Issues

Cemeteries, in general, have historically been dominated by large deciduous trees, although evergreens such as cedar are also very common. They provide a distinctly inviting image for visitors and passersby. These trees also provide some visual separation from adjacent buildings – especially in cluttered urban environments.

Ideally the trees selected should be historically appropriate. In the case of a planned cemetery, the ideal would be to use those trees selected by the original designers – respecting their original intent and interpretation. For example, there is some suggestion that the road or path in the white section was lined by maples. However, for some trees present it may be that the plantings were either already present on the site or that they are accidental or opportunistic plantings.

All other issues being equal – plantings should focus on those tree species that are known to have been used. While diversification may be acceptable, it should not dilute the original design or intent. Therefore, we urge care in selecting additional plantings, focusing on a small number of historically appropriate trees to maintain the historical integrity of the cemetery.

It may, however, be appropriate to make minor changes for the good of the cemetery. For example, there are a very large number of maples and some are better cemetery

trees than others. One example of a good maple is the Florida maple (*Acer saccharum* var. *floridum*). This tree has a round to oval growth habit, grows 50-60 feet in height and has a 25-40 feet spread. Its fruit produces no significant litter problem, branches do not droop, the tree is resistant to breakage, and it requires little pruning to develop a strong structure. It has high drought tolerance and its roots do not tend to present problems.

Some trees, whether historically appropriate or not, should probably be avoided since they pose significant maintenance issues. These include trees that produce dense shade (causing problems with the turfgrass); trees that exhibit suckers or surface roots (also causing turfgrass problems, e.g., beech, honeylocust, linden, poplar, and willow); trees that drop large quantities of leaves, seeds, or sap (such as ash, black cherry, catalpa, ginko, horsechestnut, mulberry, and sweetgum); and trees that are especially weak or vulnerable to wind or ice damage (such as ash, black cherry, pine, poplar, red maple, silver maple, tuliptree, willow, and white ash).

There is no such thing as a perfect tree. Many of the historically appropriate species have significant problems. At least some of these problems, however, can be overcome through judicious placement and appropriate planning.

Tree issues such as these are important because many of the trees in the white section are very old and likely approaching decline. While it is true that trees should be replaced as they are removed from the landscape, it is equally important that trees should be planted in anticipation of older trees declining. This allows young trees to become established and the landscape is not made barren by the sudden need to remove an old tree.

The town, using either their certified arborist or an outside contractor, should assess the health and condition of the existing trees and develop a long-term tree plan.

Planting Issues

Locations chosen for planting should not interfere with gravestones, curbing, or fences. Issues of security should also be considered and the use of small trees that obscure eye level views should generally be limited or avoided.

Research is suggesting that trees, especially older mature trees, improve in health when turfgrass is removed under the branch spread and mulch is applied at a depth not exceeding 3 to 4-inches. Over mulching should be carefully avoided.

There are a number of areas in the cemetery where removing the turf and establishing mulch zones would be useful. This process would not only improve the health of the trees, but also reduce mowing requirements.

All replacement trees should be of at least 1-inch caliper and meet the minimum requirements of the American Nursery and Landscape Association's American Standard for Nursery Stock (ANSI Z60.1-2004).

Maintenance Issues

Maintenance involves at least four basic issues: watering, fertilization, pruning, and pest control.

The town does not, on a routine basis, water trees in the cemeteries, relying instead on rainfall. While this is typically acceptable and we understand the Park and Recreation Department does not typically water mature trees, the landscape plan should include provisions for deep-root water during periods of severe drought (assuming this is permissible under the ordinances at the time). This is a critical step necessary to protect the historic landscape fabric of the cemeteries. Using a root feeder without fertilizer, it is possible to apply water 12-inches below the surface. This approach can not only be used during severe

drought, but also during extended periods of dry weather during the winter (as long as the temperatures are above freezing).

The staff reports that no tree fertilization (or soil testing) is conducted because of the funds required. The trees in each of the city cemeteries are vital components of the landscape. They represent part of the historic fabric and steps must be taken to protect that aspect of the landscape and vista.

While shoot growth (growth occurring in the present year) and foliage color are often used as indicators of nutrient deficiency, the best indicator of whether fertilization is necessary is a soil test. Samples should be taken every 3 to 5 years to determine whether any macro or micronutrients are lacking.

Soil tests are not expensive. The University of Tennessee Extension Service performs soil testing for only $6 per sample (see http://www.utextension.utk.edu/publications/pbfiles/pb1061.pdf for additional information).

Thus, the soil testing costs for both cemeteries would be less than $100 every 3 to 5 years – a very modest investment considering the importance of the landscape.

Based on the recommendations of a certified arborist, the city should then anticipate periodic fertilization (possibly including adjustment of pH through liming and the addition of soil amendments). Fertilization should be conducted on the basis of need and excess fertilization can damage trees; nevertheless, the ISA position is that, "tree fertilization should be done in accordance with ANSI A300 standards" (Lilly 2001:47). These ANSI A300 (Part 2)-1998 standards represent the standard of care of the industry. This is why more proactive involvement by certified arborists in cemetery maintenance will be useful.

Fertilization is typically accomplished through deep root fertilization – an approach where the liquid fertilizer is injected into the soil with a probe, usually 6 to 12-inches below the surface at a spacing of about 2 to 3 feet. This process not only provides fertilization, but also some aeration of the soil. An alternative approach used a drill to excavate holes in a similar pattern which are then filled with a granular fertilizer. Either is acceptable. The ANSI 300 standards allow foliar applications, injections, or implants only when soil application is impractical or ineffective.

It is best to fertilize trees when they are actively growing and have available water to help absorb nutrients. In northeast Tennessee this is typically from the spring, after new leaves emerge, through mid-season. Fertilizer should not be applied late in the season or during periods of drought.

In a cemetery setting organic fertilizers should be the primary choice. These materials, such as cottonseed meal and bone meal, have much lower salt indices than inorganic fertilizers – resulting in reduced salt uptake by monuments. This is important since salts cause staining, spalling, and deterioration of marbles, sandstones, brick, and even granites. In addition, organic fertilizers have a slower release rate and are easy on the root systems.

During our visit we noticed many damaged trees, including incorrect pruning practices, crossed branches, double leaders, and especially a failure to remove deadwood (Figure 18). This last problem is particularly common; it poses a significant threat not only to the visiting public, but also to the monuments themselves.

Taken together these problems suggest either a lack of expertise on the part of those conducting the pruning or a lack of staff to do and appropriately supervise the necessary work. Another possibility is that those performing the work simply do not realize the importance of these trees in the cemetery landscape.

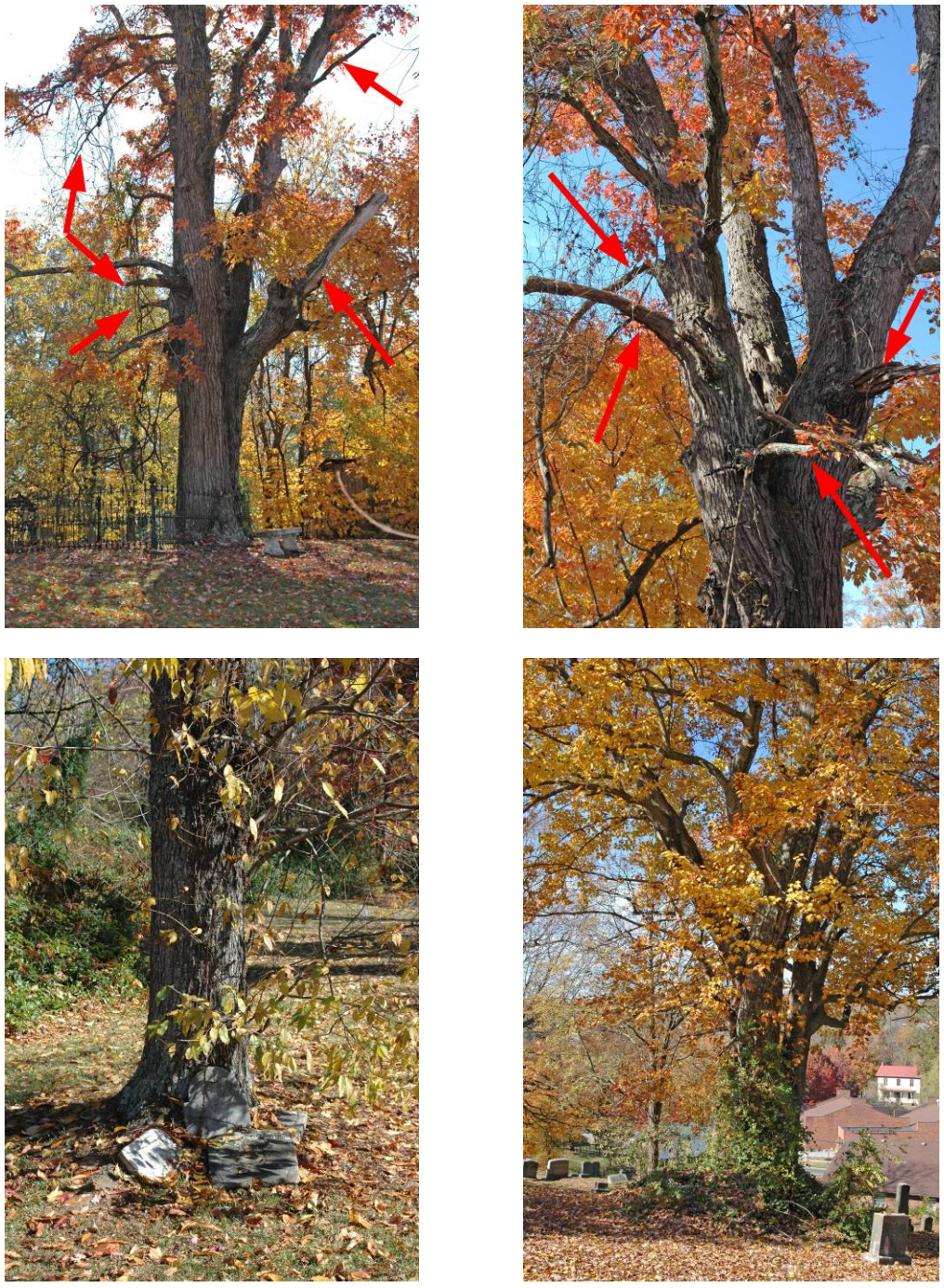

Figure 18. Tree problems. Upper photos show abundant dead wood, as well as improper pruning, broken branches where the wound has not been cleaned, and vines in the canopy. Lower left photo shows suckers that should be removed. Lower right photo shows abundant vines on a tree. These vines should be removed.

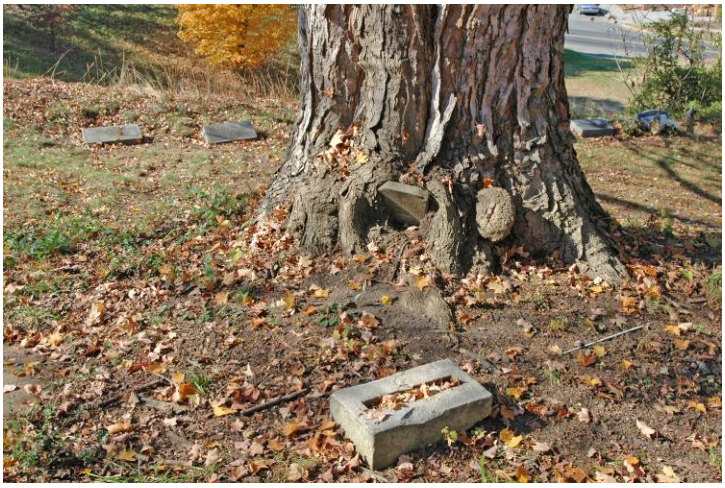

Figure 19. Tree that has nearly engulfed a footstone. It is impossible to remove such stones without causing significant damage to the tree.

Regardless, there is much work to be done at the cemetery. There are a number of trees that require pruning for either thinning or cleaning. Thinning is a technique of pruning that removes selected branches to increase light and air movement through the crown. This also decreases weight on heavy branches. The natural shape of the tree is retained and its overall health is improved. In cleaning, the pruning removes branches that are dead, dying, diseased, crowded, broken, or otherwise defective. This includes narrow crotches.

Trees should be pruned in such a manner as to preserve the natural character of the plant and in accordance with ANSI A300 (Part 1) - 2001 standards.

In pruning, branches should always be cut just beyond the branch collar (an extension of the main stem) and not flush with the trunk. Large branches should be removed with three cuts to prevent tearing of the bark which can weaken the branch and lead to disease. All pruning within the cemeteries should be performed by an ISA Certified Arborist, preferably one who is also an ISA Certified Tree Worker/Climber Specialist.

Rigging and/or a crane must be used to minimize the potential for damage to stones or the landscape. Under no circumstances are tree climbers (hooks, spikes, gaffs) to be worn while ascending, descending, or working in trees to be pruned.

There are some situations in the cemetery where plantings – intentional or voluntary – have grown to interfere with stones or fences (see, for example, Figures 17 and 19). In these cases a decision needs to be made concerning the value of the planting vs. the value of the monument or fence. Where the tree has greater value, it may be appropriate to slightly relocate the monument – moving it to a location where additional damage will be avoided if the stone or fence has not yet been overtaken by the tree. If removal would damage the tree, it is necessary to leave the fence or stone until such time as the tree needs to be removed. Only then is it possible to cut the item out and conduct the repair necessary. This decision may be aided by

Figure 20. Volunteer tree that should be removed before causing damage.

carefully evaluating the health of the tree involved.

Whenever tree removal is deemed necessary the trunk should be cut as close to the ground as possible, leaving the stump in place to decay naturally. No chemical additives should be used to hasten decay, although it is acceptable to paint an herbicide on the stump if it is a tree that will promote suckers.

Figure 20 illustrates one of several volunteer trees that, if not removed, will eventually cause significant problems. The presence of such volunteers reveals that adequate maintenance is not being provided.

Pest Control

During this visit we observed no obvious evidence of pests or disease. Where possible, Integrated Pest Management practices should be implemented. Where chemical pesticides are necessary, they should be applied as a coarse spray to prevent drift. Special care must be exercised to prevent application of chemicals to the stones.

Fire ants were not observed in the cemetery and it does not appear that they have moved as far north as Washington County. The town, however, should be aware of their threat – this insect is not only a hazard to the public, but it can degrade the cemetery landscape.

Current expectations for another 100 miles of fire ant movement may place colonies in Washington County.

Figure 21. Examples of shrubby masses that should be removed from the cemetery.

Shrubbery

The African American section does not evidence any maintained plantings, although bulbs may be present but not observed during our assessment. In the white section the only obvious planting were yuccas found on three plots. There were, however, several large clumps of vegetation that may have been intentionally planted in the past. They have been so ignored, however, it is today difficult to determine exactly what is present.

Figure 22. Yucca at one plot showing a volunteer tree that should be removed.

The absence of plantings is consistent for a very old town cemetery where space was at a premium. It is surprising that the early twentieth century did not make more use of plantings. This, however, is not necessarily "bad" since owner plantings often lack any unifying or cohesive theme, making them appear disjointed. Likewise, the cemetery has been spared episodes of "beautification" with no clear planting plan.

We suspect that past caregivers ignored what shrubbery there was, focusing on mowing. This allowed invasive, weedy species to find refuge in the shrubs and take over. Today the result is a mass of vegetation in at least three locations.

These represent either entirely junk vegetation or plantings that are so old and ignored that renewal is no longer possible. Consequently, we recommend their removal.

While shrubbery can provide historically appropriate accents, it also represents a significant investment in labor for maintenance. Given the current limitations of the town, we do not recommend any replacements (we believe it is better, at present, to focus on replacement trees as previously discussed).

Turfgrass Issues

Turfgrass should be an important concern of cemeteries, although rarely is it given adequate attention. With an appropriate turfgrass, mowing frequency is reduced. This reduces labor costs, pollution, equipment expenditures, and perhaps most importantly to historic properties, damage to the stones.

We did not identify any area where we found a thick turfgrass. Instead, the cemeteries consist of a tall fescue, bermuda, and other grasses (such as timothy and orchard grass). The bermuda/fescue mix is not uncommon, but generally the fescue is the weaker of the two and will slowly die out.

The bermudagrass is a common warm season turfgrass with some positive qualities, including excellent wear and drought tolerance. Nevertheless, its disadvantages are numerous and include its difficulty to control, rapid growth rate, tendency to produce thatch, and abundant and unsightly seed heads. While these characteristics could be controlled through careful selection of varieties, such an approach would require extensive effort. It should be cut to a length of 1-2 inches.

Figure 23. Examples of mower and trimmer damage. The height of damage shown in the top photo is consistent with a riding mower. Damage in the lower photo may represent mower or trimmer, although the edge damage is from mower impact.

The tall fescue is classified as a cool season turfgrass, although it is actually a transition zone grass, found in areas of moderately cold winters and warm summers. While it has good temperature tolerance for a cool season grass, it does go into summer dormancy. It prefers full sun, but can tolerate some shade. It has good drought tolerance and adapts to a wide range of soil conditions. It is cut at a length of 2-3 inches

Figure 24. Example of scalping found in the cemetery.

Orchardgrass is a cool season perennial that is relatively tall growing. Orchardgrass does not exhibit as much tolerance to drought or winter hardiness as tall fescue. It is generally intended to be a pasture or hay grass and is usually considered a weed grass of turf areas. Compared to other cool season grasses, timothy is relatively short-lived and it, too, is usually considered a weedy invader of turf.

In addition to these obvious grasses, the cemetery also contains a variety of broad leaf "weeds" – undesirable species that cause the grounds to look unkempt and require frequent mowing to keep them in check.

Mowing

Mowing at the two cemeteries is conducted very differently. In the white section mowing during the growing season is every two weeks using two zero turn mowers, one with 62-inch deck and the other with a 45-inch deck. The mowing is followed by extensive use of nylon trimmers equipped with 0.095-inch line.

The use of riding mowers can be problematical, especially in a setting such as the white cemetery where monuments, coping, and fences present significant obstacles. It would be far better to abandon riding mowers and convert mowing at the cemetery to the use of walk behind mowers with decks no larger than 21-inches.

While mowing less frequently may have some appeal, the removal of grass adjacent to monuments would become more difficult with longer and thicker grass blades – and this in turn could lead to more damage to the stones. The current frequency of mowing should be maintained. It could be safely reduced only with extensive lawn renovation to establish a dense and weed-free turf.

The use of nylon trimmers around monuments, coping, fencing, and plantings is an acceptable practice, but it is critical that a very light weight line be used – along with worker attention – to minimize damage to soft stone such as marble and sandstone. As mentioned, it is reported that 0.095-inch line is being used. We recommend that the cemetery staff switch to a 0.065-inch line which is safer for use around stones.

Figure 23 shows examples of the impact of a mower as well as by the use of nylon

trimmers with line that is too heavy. All mowers used in the cemetery should have a closed cell foam pad attached to the sides and front edges. This bumper will help to minimize accidental damage.

It is also important to prevent scalping the grass – a problem that we observed in several areas and is likely caused by the use of large mower decks on uneven ground (see Figure 24).

Scalping causes severe visual damage. More importantly, scalping shocks the grass plants and growth slows or stops, limiting the vigor of the turf. A scalped lawn may dry out quickly from drought, or may develop unusual weed and disease problems.

In the African American section we are told that push mowers are already used, although by prisoners. As explained earlier, we suspect that prisoners tend to be less careful than paid staff. We are also uncertain about the use of trimmers in this section. Regardless, there does appear to be less mower and trimmer damage in that cemetery – although many of the stones are granite which is more difficult to damage.

Figure 25. Possible groundhog hole in the African American section.

Fertilization and Weed Control

The cemetery staff does not routinely conduct soil tests and no fertilization is applied. We recommend that soil tests be conducted every 3-5 years; the source for this testing in Tennessee has already been discussed.

In general bermudagrass desires a soil pH between 6.5 and 8.0. Tall fescue prefers soil with a pH between 5.8 and 6.5. Thus, 6.0 to 7.0 may be a good compromise if both grasses are to be maintained. Otherwise, the use of the turf and its desired appearance (in addition to the soil test) will dictate the amount of fertilization.

For top appearance, heavier fertilization will be required, with multiple, light applications of nitrogen and a yearly application of potassium and phosphorus.

Good information concerning fescue in Tennessee can be found at http://www.utextension.utk.edu/publications/pbfiles/PB1576.pdf, while similar information on bermudagrass can be found at http://www.uaex.edu/Other_Areas/publications/PDF/FSA-6121.pdf.

As previously discussed, in order to minimize salt uptake by the stones, slow release organic fertilizers should be used and inorganic fertilizers should be avoided.

Park and Recreation reports that no effort is made to control weeds in the cemetery turf. Given that the lawns are not an established turf, any efforts to control weeds will be difficult and almost certainly lead to areas of kill-off or noticeably thinned grass. In addition, pre- and post-emergent

controls are intended for broadleaf weeds. Control of other grasses is very difficult and time consuming.

Some consideration should be given to a program of slowly renovating the lawns to establish a single grass that can be more easily maintained and that will require less frequent mowing.

Pest Control Practices

The single significant pest control issue for most cemetery lawns, previously mentioned, is the control of the imported fire ant. While not yet in Washington County, the town should be ready to treat the cemetery should they be introduced.

We did observe an animal burrow at the African American section, suggesting that the cemetery may have groundhogs. We do not recommend any control measures at this point, but holes such as this should be filled for public safety.

Renovation

Given the cost of renovation (approximately $10,000 per acre) we cannot recommend implementing a renovation program at this time. Nevertheless, we do recommend that the town consider the benefits and evaluate if such an effort would provide a reasonable payback in reduced maintenance costs.

It may be that some benefit could be obtained by overseeding the existing turf with bermuda seed. Additional information on overseeding bermuda can be obtained from http://www.bermudagrass.com/info/overseeding.html.

Any renovation effort would, however, require at least temporary water until the seed becomes established. This could be achieved through the use of temporary above ground piping (we do not recommend efforts to established irrigation systems in cemeteries).

In the white section there are many heavy shade areas where almost all grasses will fail to perform effectively. Our best advice, especially for areas under trees, is to remove the sod (which rarely does well in such circumstances) and replace it with 2-3 inches of mulch. This will also promote better tree health.

Irrigation

Neither cemetery section has an irrigation system and, in general, we do not recommend them – they use very large quantities of water, their placement can interfere with markers and graves, and their operation can cause erosion to stones.

It may be prudent, however, to have water lines with hose bibs placed at least at the entrance to the two sections. A Woodward (or equivalent) sanitary hydrant would provide back flow prevention, frost proofing to a depth of 2-3 feet, and allow the faucet to be locked to prevent misuse. This approach would allow specific lawn areas that might be stressed by drought to be watered. In addition, areas where the lawn is being renovated can be watered to encourage the seed to sprout.

This is an especially important issue in the African American cemetery where burials are still being conducted. We notice that there is no effort to resod or reseed the lawn – leaving bare earth that promotes the growth of weeds. The filling of these depressions, followed by seeding or sodding, is an essential cemetery practice.

Other Landscape Issues

The cemetery has avoided the unfortunate issue of lot owners using gravel in plots in an effort to control weeds. Graveled lots almost always present a variety of long-term maintenance problems. In addition, the practice

is not historically appropriate to the cemetery. The town should discourage the practice whenever possible.

Figure 26. Filled grave area that has not been sodded or seeded.

There is some evidence that sunken, unmarked graves are being filled in the African American section and we acknowledge that this practice is necessary for the safety of the public. However, filling of graves should not take place until the cemetery has been mapped. These depressions offer the best evidence of where burials have taken place and they should not be lost by filling. The creation of a detailed map, showing not only marked, but also unmarked graves, would allow sunken graves to be filled.

Recommendations

Park and Recreation should have at least one full-time individual assigned to no duties other than the care of the two cemetery sections. This one individual would need seasonal assistance during the growing season.

Those responsible for the care of the cemetery should be encouraged to become certified by PLANET (or some similar local organization) in categories such as Landscape Technician – Exterior, Turfgrass Professional, or Ornamental Landscape Professional.

Continuity of care, coupled with appropriate training, is especially important for the fragile cemetery landscape and monuments. This cannot be achieved with the use of prison labor and we recommend this practice be terminated in favor of dedicated staff maintenance.

Tree selection within the cemeteries should be focused on historically appropriate species, based on identification of either original planting lists, replication of identified historic species in the specific cemetery, or using period lists. Species should, however, be evaluated to eliminate those with problems such as suckers, surface roots, inherent weakness, etc. The town should develop a tree plan to ensure that when any tree must be removed, an appropriate replacement is planted in its place.

All replacement trees should be of at least 1-inch caliper and meet the minimum requirements of the American Nursery and Landscape Association's American Standard for Nursery Stock (ANSI Z60.1-2004). Nursery stock should be carefully inspected and specimens with wounds, crooked or double leaders, broken branches, or girdling roots should be rejected.

Trees within the cemetery should be fertilized on a routine basis and should be professionally evaluated and pruned at least once every 5 years by an ISA Certified Arborist. All trees should be inspected yearly and after any storm with winds in excess of 55 mph.

The Cemetery evidences a number of tree maintenance issues. Only ISA Certified Arborists should be responsible for tree pruning and maintenance.

Trees in both cemetery sections should be pruned for thinning or cleaning as recommended by a certified arborist.

There are volunteer trees in several areas that, if not removed, will become problems to stones and fences. These volunteer trees should be immediately removed. Where trees are already damaging monuments, it is important to evaluate the health of the tree and its importance to the landscape. In many cases the tree will be found to be integral to the landscape and should not be removed. Fence sections and monuments can be rescued after the tree succumbs to old age.

Shrubbery is not common and given the limited maintenance resources we do not recommend that any be planted. We did identify several shrubby masses that should be removed since renewal pruning is not feasible.

The use of large deck mowers at the cemetery should be eliminated in favor of 21-inch push mowers which are much less likely to damage stones or scalp the turf.

Mowers used in the cemetery should be fitted with closed cell foam bumpers to reduce the damage to the stones. These bumpers should be inspected on a weekly basis and replaced as needed.

After mowing string trimming is necessary in all cemeteries. However, we recommend that only 0.065-inch line be used in the cemetery. Heavier line is damaging the stones and cannot be safely used.

Soil analysis should be conducted to determine if adjustments are necessary for the turfgrass. Where fertilization is needed, only organic, slow release fertilizers should be used in order to minimize salt damage to the stones.

The cemetery has a variety of non-lawn grasses, as well as broad leaf weeds. Pre-emergent and post-emergent weed control may not be successful in the cemeteries. We do, however, recommend consideration be given to slowly renovating sections of the cemetery to promote a turf that is capable of choking out weeds and allowing the frequency of mowing to be reduced.

The town should be alert to the possible introduction of the imported fire ant in the cemetery sections and, if found, begin immediate control measures. The town should also be aware of the possibility of groundhogs in the cemetery and the trip hazard this can pose to the public.

We recommend that the town install Woodward (or equivalent) sanitary hydrants at the entrance to both cemeteries. These can be locked to prevent misuse and are freeze protected. This would allow repair of small lawn areas through seeding or sodding as needed.

While the filling of sunken graves is an important task, it should not be done until all such graves have been mapped. The creation of such a map is of critical importance since there are no records known for either cemetery.

The use of gravel in plots is not currently a problem and they should be prohibited by the town. Grass is more historically appropriate and easier to maintain.

OTHER MAINTENANCE ISSUES

Signage

From a cemetery preservation perspective signage is of four basic types: identification, regulatory, informational, and interpretative. They are generally recommended in this same priority.

Identification signage might include the name of the cemetery and might also include the cemetery's date of founding and historic significance (i.e., eligible for listing or listed on the National Register).

Regulatory signage specifies laws, regulations, or expected standards of behavior. These should be clearly posted at the entrance to the cemetery.

Informational signage might include directional signs, routing, and section numbers. These should have a consistent signage theme (for example, colors, size, font, and placement).

Interpretative signage might include information on historic people buried in the cemetery. It is important that this signage be discrete, so as not to detract from the dignity of the cemetery.

Neither section of Jonesborough's cemetery has any sort of signage. Although both are readily accessible to the public, there appears to be no effort to direct visitors to the cemeteries or, once they are there, provide them with any information concerning the sites or place in the town's history.

Identification Signage

We recommend that both cemeteries be marked by identification signage consistent with that adopted by the town for its historic properties. This identification signage can be combined with the regulatory signage discussed below. This will help prevent "sign cluttering."

Regulatory Signage

We recommend that the city develop regulatory signage dealing with, minimally, these issues for both sections (perhaps with some modifications of language as might be needed):

- Many of the stones in this cemetery are very old and may be easily damaged. Consequently, absolutely no gravestone rubbings will be allowed.
- The stones and monuments in this cemetery are fragile. Please refrain from leaning, sitting, or climbing on any monument. All children must be escorted by an adult.
- Absolutely no alcoholic beverages, fireworks, or firearms are allowed in the cemetery. Proper conduct is expected at all times.
- No pets are allowed in the cemetery.
- Flowers will be removed by the staff 10 days after holidays or when the arrangements become wilted and unsightly.
- No plantings are allowed within the cemetery and the cemetery will enforce its right to remove any plantings deemed inappropriate, diseased, or damaging the cemetery.

- For additional information concerning maintenance issues, please contact _____ at _____. In case of emergency contact _____.

This regulatory signage is particularly important since the cemetery sections are small and it may not be possible to ensure full-time staffing (although this has been recommended). It is very important that the public be instructed on appropriate cemetery etiquette and behavior.

Informational Signage

The cemeteries are sufficiently small that no informational signage is needed and would distract visitors from the more significant aspects of landscape, fencing, and memorials.

Interpretative Signage

The 2008 draft of the Ralph Applebaum document, *An Interpretative Masterplan for Historic Jonesborough,* recommends "a new introductory panel with a site map." If this can be acted upon in the near future it represents an excellent plan. Otherwise, the town should not wait to provide interpretative information – there are two alternative approaches.

Many cemeteries find that brochures are a useful supplement to traditional signage, allowing greater flexibility. Brochures may also replace (or at least reduce the need for) informational and interpretative signage. Brochures also have the benefit of being useful as educational and promotional tools. They may be provided at the cemetery in weather tight containers, allowing visitors to tour at their own leisure and pace. They may also be provided at other locations in town as a tool to promote the cemeteries.

A second option is to use a Tennessee Historical Marker erected at the entrance to both cemeteries. These markers are coordinated by the Tennessee Historical Commission in the Tennessee Department of Environment and Conservation. Although the web site provides little information, such signage is typically paid for by the sponsor and in most states the cost is about $1,500 per sign.

Flowers and Other Grave Decorations

During our visit we found very few flowers at either cemetery and little indication that they are, at present, a significant problem. Nevertheless, we recommend that the town adopt flower regulations. Faded and unsightly arrangements (particularly silk or plastic) can dramatically degrade the cemetery landscape.

Many cemeteries are beginning to also struggle with the increasing tendency for the public to load graves with personal items. This problem is not unique to the United States, but has also been documented in Great Britain, where solar-powered lights, statues and windmills have appeared.

Some cemeteries have established rules based entirely on appearances. At times these are intentionally vague, for instance referring to "adornments considered offensive or otherwise inconsistent with the dignity of the cemetery." In other cases a fairly detailed list of objectionable items has been devised: "Toys, stuffed or otherwise manufactured or sculptured animals, statues or statuettes, personal items and/or other unsightly objects."

Although aesthetics may reasonably be considered to suffer, most cemeteries attempt to control the proliferation on the grounds of the potential hazard to workers – a legitimate concern considering the use of mowers and trimmers on a routine basis.

Many cemeteries enact provisions that allow staff to remove such objects ("temporary objects") when they become withered, unsightly, or an obstruction to maintenance. Other cemeteries exclude all objects made of concrete, glass, plastic, fiberglass, metal,

ceramic, and wood, again with the justification of safety.

While wishing to be sensitive to those who have lost loved ones, there must still be a middle ground that helps control the abundance of materials that can appear in even historic cemeteries. Enacting regulations now, before there are issues, will help prevent hard feelings.

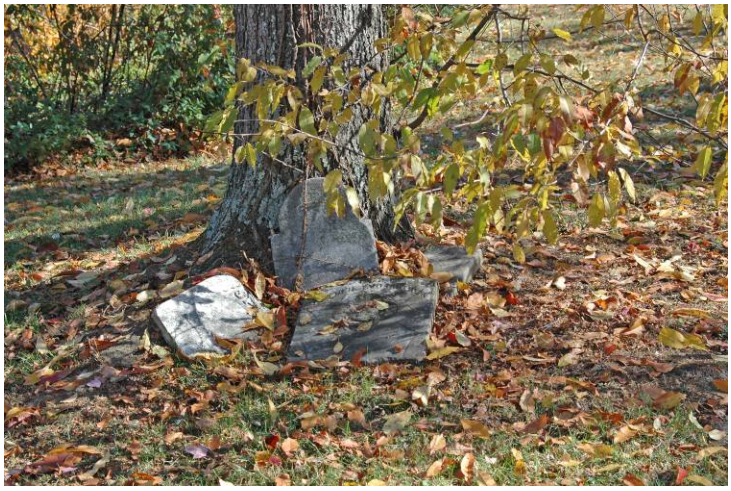

Figure 27. Broken stones piled at the base of a tree in the white section.

Trash

There was very little trash in either of the cemeteries and we take this as evidence that the Park and Recreation staff is doing a good job of picking up the areas, probably prior to mowing or other activities.

While trash containers are often recommended for cemeteries – and can be located at entrances of small burial grounds so as not to detract from the landscape – we see little need for this at present. In fact, putting out trash containers would only serve to increase maintenance activities and further stretch an already overextended staff.

The town, however, should monitor the cemeteries for trash. This may become a more pronounced issue in the future, especially if the cemeteries receive greater visitation.

Lost Stones

Lost, orphan, or misplaced stones were observed primarily in the white section (Figures 27 and 28). These are stones that have been removed from the original grave and deposited elsewhere in the cemetery. Stones move for a variety of reasons, but the most common is an effort by maintenance crews to place them out of the way.

Staff must understand that once a stone is separated from the grave, the potential that the grave will become lost – regardless of the quality of the cemetery records – dramatically increases. Thus, every effort should be made to ensure that stones remain on their grave.

Stones should never be removed from their original location without full documentation – where was the stone found,

Figure 28. Broken stone leaning against a stump.

why is it being removed, where is it being stored, what should be done to reset the stone, what action is being taken to resolve the issue.

We recommend that the misplaced stones be collected and stored by the town in the hope of being able to ascertain their original locations and replace them.

Recommendations

The town should develop identification and regulatory signage for both cemetery sections. This signage should minimally deal with proper care of the monuments, prohibiting rubbings and warning visitors of their fragile condition; it should prohibit certain behaviors and actions, such as use of alcoholic beverages; it should established simple guidelines for plantings, as well as the placement and removal of floral and grave decorations; and it should include contact and emergency information.

Interpretative signage should be developed specifically for the cemetery, but if this is not possible, alternatives include either a brochure specific to the cemetery or the erection of Tennessee Historical Markers at the two locations.

If a brochure specific to the cemeteries is developed, it should include rules, maps, brief histories, and perhaps some information on those buried in the cemeteries. While primarily intended for families and visitors, it could also be used for promotion and fund raising.

The town should establish flower regulations that maintain the dignity of the cemeteries and allow reasonable maintenance. We recommend limiting flowers on graves to a maximum of 10 days. We also recommend that only cut flowers or live plants be used.

Trash does not appear to be a significant problem, but the town should be aware that additional visitation may increase trash concerns.

No stones should be removed from graves without adequate documentation. The apparently "lost" stones should be researched and replaced as well as possible. Until then they should be collected and stored for safekeeping.

CONSERVATION ISSUES

What is Conservation?

Conservation is *not* restoration. Restoration means, very simply, making something "like new." Restoration implies dramatic changes of the historic fabric, including the elimination of fabric that does not "fit" the current "restoration plan." Restoration is inherently destructive of patina and what makes a property historic in the first place. The "restorer" of a property will know nothing of the Secretary of the Interior's Standards for Preservation and cares even less.

One of the most important early writings was that of nineteenth century art critic and observer John Ruskin. In *The Seven Lamps of Architecture* published in 1849 and in particular, "The Lamp of Memory," Ruskin introduces us to the issue of trusteeship where he explains,

> it is again no question of expediency or feeling whether we shall preserve the buildings of past times or not. We have no right whatever to touch them. They are not ours. They belong partly to those who built them, and partly to all the generations of mankind who are to follow us.

Ruskin also crisply states the difference between restoration and repair, noting that "restoration" means,

> the most total destruction which a building can suffer: a destruction out of which no remnants can be gathered: a destruction accompanied with false description of the thing destroyed.

In contrast, conservation can be defined as preservation from loss, depletion, waste, or harm. Conservation seeks to limit natural deterioration.

Conservation will respect the historic fabric, examine the variety of options available, and select those that pose the least potential threat to the property. Conservation will ensure complete documentation, whether it is of cleaning, painting, or repair. Conservation will ensure that the work done today does not affect our ability to treat the object tomorrow.

Standard for Conservation Work

As Ruskin stated, the Town of Jonesborough is the steward of these cemeteries, holding what belonged to past generations in trust for future generations. As such the town bears a great responsibility for ensuring that no harm comes to the properties during their watch.

One way to ensure the long-term preservation of these properties is to ensure that all work meets or exceeds the Secretary of the Interior's Standards for Preservation, discussed on pages 1-3 of this study.

Another critical requirement is that the town ensure that any work performed in the cemetery – whether it involves the repair of iron work, the cleaning of a stone, or the reconstruction of a heavily damage monument, is conducted by a trained conservator who subscribes to the Standards of Practice and Code of Ethics of the American Institute for Conservation of Historic and Artistic Works (AIC).

These Standards cover such issues as:

- Do no harm.
- Respect the original fabric and retain as much as possible – don't replace it needlessly.
- Choose the gentlest and least invasive methods possible.
- Is the treatment reversible? Is retreatment possible?
- Don't use a chemical without understanding its affect on the object and future treatments.
- Don't falsify the object by using designs or materials that imply the artifact is older than it is.
- Replication and repairs should be identified as modern so that future researchers are not misled.
- Use methods and materials that do not impede future investigation.
- Document all conservation activities – and ensure that documentation is available.
- Use preventative methods whenever possible – be proactive, not reactive.

The AIC Code of Conduct also requires a professional conservator provide clients with a written, detailed treatment proposal prior to undertaking any repairs; once repairs or treatments are completed, the conservator must provide the client with a written, detailed treatment report that specifies precisely what was done and the materials used. The conservator must ensure the suitability of materials and methods – judging and evaluating the multitude of possible treatment options to arrive at the best recommendation for a particular object.

General Types of Stone Damage

Although a stone-by-stone assessment was not included in this assessment, it is possible to provide some general observations concerning the types of problems faced in the town's cemetery. An approximate count of different problems was made for the two sections and is provided here as Table 2.

Table 2.
Stone Problems in the Two Sections

Stone Problem	White Section	African American Section	Total
Broken	29	24	53
Ferrous pins, iron jacking	7	-	7
Tilted	24	12	36
Toppled	21	6	27
Spalling sandstone	14	-	14
Displaced stones (orphaned)	30	7	37
Total	125	49	174

Broken Stones

There are about 53 examples of broken stones. Many of these stones should receive a high priority for conservation treatments since the stones are either a hazard to the public (endangering visitors) or a hazard to themselves (if they fall there will be additional, significant damage that will dramatically increase the cost of repair).

The identification of these stones and development of treatment proposals by a professional conservator should be a very high priority. It is only with the development of detailed treatment proposals and cost estimates that a reasonable budget for this conservation work can be determined. We recommend a stone-by-stone assessment and development of treatment proposals as a very high priority for the cemetery.

In most cases gravestones are fragile and their repair is delicate work. There are many commercial products on the market, used by many commercial stone companies, which are inappropriate for (and often damaging to) historic stone.

Appropriate conservation treatment will usually involve drilling and pinning, carefully aligning the two fragments. Threaded 316 stainless steel rod (or occasionally fiberglass)

Figure 29. Examples of broken stones and stones with ferrous pins. Top row illustrates several piles of multiple broken stones that will need to be sorted and further evaluated. Middle row left shows a badly fractured marble ledger. Middle row right shows a broken marble stone poorly reset. The bottom row illustrates stones with ferrous pins that failed; as the stones toppled, additional damage was caused. Treatment will involve removing the ferrous pins, replacing them with stainless steel pins. The upper break will then require blind pin repairs. Damaged areas will require the use of an infill material.

Figure 30. Examples of tilted and toppled stones, all requiring resetting. Some will also require either removal of failed pins or drilling to install new pins for safety.

and epoxy adhesives formulated for the specific stone are used in this type of repair. Diameters and lengths of pins vary with the individual application, depending on the nature of the break, the thickness of the stone, its condition, and its expected post-repair treatment.

Sometimes pins are not used in a misguided or misinformed effort to save time and money. Instead the pieces are simply joined using a continuous bead of epoxy or some other adhesive. Experience indicates that for a long-lasting repair, particularly in structural applications, use of pins is necessary. Moreover, most adhesives are far stronger than the stone itself, meaning that failure of the repair is likely to cause additional damage to the stone.

Ferrous Pins

Seven stones – all in the white section – were observed with ferrous pins. The results of their deterioration is also clearly evident. These should be given a high treatment priority since, left untreated, the corrosion will cause significant spalling, cracking, and breakage of the stones. In these cases it will be necessary to use diamond core drills to remove the ferrous pins. They will then need to be replaced with stainless steel pins.

After many such repairs it will be necessary to fill the voids with a natural cementitious composite stone material resembling the original as closely as possible in texture, color, porosity, and strength. This type of repair may be used to fill gaps or losses in marble and is often used to help slow scaling of bedded sandstone exposed to the elements.

Under no circumstances should latex or acrylic modified materials be used in composite stone repair. These additives may help the workability of the product, but they have the potential to cause long-term problems. Such products are not appropriately matched in terms of strength or vapor permeability.

More suitable are materials such as Jahn (distributed by Cathedral Stone) or the lime-based mortars of U.S. Heritage. These closely resemble the natural strength of the original stone, contain no synthetic polymers, exhibit good adhesion, and can be color matched.

All infill work should be conducted by a trained conservator. The Jahn products, in fact, require certification in their use through Cathedral Stone.

Tilting and Simple Resets

About 36 stones are seriously leaning. When this occurs to headstones, the tilt may be sufficient to precipitate a ground break, dramatically increasing the cost of repair. For other monuments the tilt may be sufficient to cause the monument to fail and, in the process, there may be additional damage. These stones can also harm visitors and create liability.

Monuments should never be reset using concrete, but rather should be set in pea gravel. This approach allows the stone some movement should it be accidentally impacted by lawn maintenance activities. The pea gravel will also promote drainage away from the stone, helping the stone resist the uptake of soluble salts.

While resetting can be done by a conservator, it is a task that volunteers can readily perform.

Resetting Toppled Stones

When tilting stones are not reset, they eventually topple. We identified about 27 such monuments in the two sections.

At times mechanical repairs also involve dismantling intact elements and ensuring that a sound foundation is present. Foundation work may involve filling in depressions, establishing a concrete footing, or taking other measures to ensure that subsidence is minimized. Then the entire structure is repaired as it is reassembled.

Figure 31. Examples of old failed repairs, sandstone spalling, and other issues. Top left shows an old failed repair. Top right shows inappropriate repair using gray Portland cement. Middle left shows spalling sandstone. Middle right shows three stones damaged by paintballs that require cleaning. The bottom row shows two examples of badly spalling concrete monuments.

Spalling Sandstone

Many sandstones used in monuments, especially the brown sandstone from the northeast belt (for example the "brownstone" from the Portland-Middletown, CT quarries) as well as local stone, are becoming increasingly difficult to repair due to weathering and poor installation. Problems include delamination, erosion, spalling, scaling, blistering, and flaking. Most of these problems can be traced back to moisture and the introduction of salts.

Treatments are limited and involve the use of consolidants (about which there remains considerable controversy), pinning (in a fashion similar to that described for repair of broken stones), use of injection grout, improvement of drainage, and replacement of lost fabric using infills.

Unfortunately, it is the earliest stones in the cemetery that were sandstones. Consequently, their treatment should also receive a very high priority in the hope that they can be stabilized.

Orphaned Stones

We identified about 37 examples of displaced or orphaned stones in the two cemetery sections and this issue has been briefly addressed under maintenance concerns in a previous section.

Fragment storage protects fallen or broken stones from loss and damage. At present there appears to be no procedure to ensure that damaged stones are identified and cared for. We found bits and pieces of stones in different locations throughout the cemeteries. In many cases broken stones have been left lying where they fell. This may result in the loss of the monument or additional damage. It may cause loss of the grave, loss of the individual's memory, as well as loss of historic fabric.

Other Issues

There are a few stones identified during this assessment that may be reset in their still extant sockets. This, too, is a fairly simple procedure that can be accomplished with little time or funds, but which will minimize the potential for additional damage to the stone.

In such cases resetting involves the use of a high lime mortar mix. In this and all other areas of treatment, the city should avoid the use of Portland cement. It is entirely too hard for the stones and may contain impurities that will damage the stone through long-term exposure. More appropriate is a 1:2 mix of NHL 3.5 and sand. Epoxy and other adhesives should never be used since once set it is virtually impossible to remove the material. Even the use of commercial setting compounds used by the monument industry should be limited to use on granite markers produced within the last 50 years.

Finally, there are a number of concrete markers in the African American cemetery that evidence extensive spalling. The failure is consistent and appears associated with the mix that was used or the way the stones were prepared. Repair of concrete typically involves an effort to consolidate the remaining monument using a product such as Prosoco's H40, followed by infill of lost material to prevent further water intrusion and freeze-thaw damage.

As this suggests, there are a number of critical stone-related problems at the cemeteries. While repairs are critical, they should not be conducted without adequate assessment, preparation of appropriate treatment proposals, and efforts to implement the preventative recommendations contained throughout this study. There is, for example, no benefit in expending treatment funds if issues such as vandalism and regulatory signage have not been addressed.

Cleaning of Monuments

A significant amount of damage may result from inappropriate cleaning techniques. The most common cleaning technique is the use of a bleach product – probably because bleach (either sodium hypochlorite or calcium hypochlorite) is widely available and inexpensive. It is, nevertheless, unacceptable for historic monuments.

Table 3.
Comparison of Different Cleaning Techniques

Cleaning Technique	Potential Harm to Stone	Health/Safety Issues
Sand Blasting	Erodes stone; highly abrasive; will destroy detail and lettering over time.	Exposure to marble dust is a source of the fatal lung disease silicosis.
Pressure Washers	High pressure abrades stone. This can be exacerbated by inexperienced users. Pressures should not exceed 90 psi.	None, unless chemicals are added or high temperature water is used.
Acid Cleaning	Creates an unnatural surface on the stone; deposits iron compounds that will stain the stone; deposits soluble salts that damage the stone.	Acids are highly corrosive, requiring personal protective equipment under mandatory OSHA laws; may kill grass and surrounding vegetation.
Sodium Hypochlorite & Calcium Hypochlorite (household and swimming pool bleach)	Will form soluble salts, which will reappear as whitish efflorescence; can cause yellowing; some salts are acidic.	Respiratory irritant; can cause eye injury; strong oxidizer; can decompose to hazardous gasses.
Hydrogen Peroxide	Often causes distinctive reddish discolorations; will etch polished marble and limestone.	Severe skin and eye irritant.
Ammonium Hydroxide	Repeated use may lead to discoloration through precipitation of hydroxides.	Respiratory, skin, and eye irritant.
D/2 Architectural Antimicrobial	No known adverse effects, has been in use for nearly 10 years.	No special precautions required for use, handling, or storage.

Table 3 discusses problems with a variety of "common" stone cleaning processes widely used by commercial firms and the public. Providing this sort of information to families who have loved ones buried at the city cemeteries may help deter abusive cleaning.

Cleaning is largely an aesthetic issue in both sections – we saw few examples where soil or biologicals were actually causing damage to the monuments. Consequently, the town should embark on an educational program to discourage inappropriate cleaning – explaining not only the dangers of bleach and other commercial methods, but also pointing out that such activities diminish the historical value and ambience of the cemeteries. These cleaning methods remove not only soil, but also the patina of age – leaving monuments that no longer appear historic.

This educational program should point out that cleaning – even when done correctly – will gradually erode monuments, making them susceptible to more soiling and damage. Consequently, cleaning should be conducted no more frequently than perhaps once every 5 years.

The safest product for cleaning is simply low pressure (less than 90 psi) water and a soft bristle brush. When some other assistance is needed a product that has been found safe for most stones is D/2 Architectural Antimicrobial distributed by Cathedral Stone.

Ironwork Conservation

Although ironwork has been mentioned previously in the section on Fixtures and Furnishings, we are briefly reviewing critical issues here.

Every effort should be made to retain all existing ironwork, regardless of condition. Replacement with new materials is not only aesthetically inappropriate, but often causes galvanic reactions between dissimilar metals. When some of the existing ironwork is incomplete, a reasonable preservation solution is to repair and maintain the remaining work rather than add historically inappropriate and incorrect substitutes. If replacement is desired, salvage of matching elements is preferred over recasting. Replication is typically not an appropriate choice since it is by far the most expensive course of action, and is often done so poorly.

The single best protection of ironwork is maintenance — and this revolves around painting. We have previously outlined specific steps and materials to use, focusing on minimal cleaning, followed by a coat of rust converter and a two top coats of a flat or semi-gloss alkyd paint.

Repair may include reattachment of elements. Ideally, repairs should be made in a manner consistent with original construction. For example, most newel posts were originally attached to a stone or masonry base using a threaded rod packed in lead. When this assembly is loose, the ideal approach is to replace the threaded rod with 316 stainless steel, and repack it using an epoxy filler (lead is rarely recommended both because of its health consequences and also because lead-iron contact promotes corrosion).

It may also be appropriate to use small stainless steel braces with stainless steel nuts and bolts to re-attach coping rails to posts. While welding is often expedient, this approach causes a radical change to the fence. Once welded, pieces are no longer able to move with expansion/contraction cycles, and this causes internal stresses that may lead to yet additional structural problems. Careful inspection of fences in good condition reveals that virtually all connections were "slip joints" – allowing the parts to expand and contract.

In addition, while wrought iron is easy to weld because of its low carbon content, cast iron contains up to 4% carbon and is difficult to weld. Welding on cast iron should be done only by firms specializing in this work and capable of preheating the elements.

When used, welds should be continuous and ground smooth, in order to eliminate any gaps or crevices. When finished, it should be difficult to distinguish the weld — the original metal should blend or flow directly into the reattached part.

Another problem observed is the burial of the bottom fence rail in soil. In such cases moisture is held against the ironwork, promoting extensive corrosion.

When the fence is buried in the soil all that need be done is to resculpt the ground, lowering it below the bottom rail. This not only resolves the corrosion problem, but will also promote better drainage away from the ironwork.

Much of the ironwork would also benefit from careful caulking of joints to prevent capillary uptake of moisture – which promotes corrosion in joints and other small crevices. An appropriate caulk is a premium-grade, high-performance, moisture-cured, single-component, polyurethane-based, non-sag elastomeric sealant (such as Sikaflex 1a). Silicone caulks should be avoided.

Another significant threat to the ironwork, however, is theft. Jonesborough is exceedingly fortunate to have a small but

diverse collection of ironwork — and many of the fences have original gates. All are attractive to thieves and the town should take immediate action to harden these targets and discourage their theft.

Recommendations

We recommend that a stone-by-stone assessment be conducted of the Old Jonesborough cemetery. This will identify all monuments and fences in need of treatment, determine their priority for treatment, and provide costs for that work to be accomplished. This is a critical planning function.

All work in the cemetery should be conducted by trained conservators who subscribe to the Code of Ethics and Standards of Practice of the American Institute for Conservation of Historic and Artistic Works (AIC). This should be the minimum level of competency required by the city on all projects.

There are some treatments, such as resetting, creation of new sockets, cleaning, and some aspects of fence repair, which can be undertaken by volunteers with training and oversight.

RECOMMENDATIONS AND FUNDING

With limited funds it is often critical that organizations establish priorities for cemetery conservation/preservation projects, ensuring that the most critical issues are dealt with first. There are different methods for assigning priorities; here we have simply organized the recommendations at each cemetery in a logical progression, but have assigned only a broad frame since we are not familiar with the funding levels available to the city.

The costs are based on the best information available at this time. Some are derived from previous projects; others are determined using Means Site Work and Landscape Cost Data. All estimates are 2009$. We recommend that local costs be evaluated since there may be significant differences. Conservation costs do not include travel, per diem, or lodging. Some tasks could not be assigned a cost since we do not have adequate information to allow a sound judgment to be made. Other costs are assigned a value of "n/c" (no cost) since the activity is one that could be undertaken by the current in-house staff. Some "n/c" tasks can be reasonably be undertaken by volunteers.

To implement the recommendations we offer will entail budgeting of at least $127,850 over the next five years.

First Priority Tasks

The cost of the first priority tasks at the cemetery is at least $53,950. The majority of this amount – $40,000 – represents funding a fence maintenance program that involves primarily painting. Although a large sum, this is spread over approximately eight plot fences and the boundary fence. It is as high as it is because these fences have been ignored for a very long period of time and this deferred maintenance has caused significant deterioration. The painting will help stem that damage, allowing for careful evaluation and longer range planning for more detailed work.

Other first priority costs are far more modest, including securing gates and fence parts ($800), having a certified arborist inspect the trees and develop a maintenance plan ($3000; a task that may be done in-house), soil testing ($150), putting bumpers on the mowers used in the cemetery ($500), and developing regulatory signage for the cemeteries ($4,000).

Besides the fence painting (which can be done either by volunteers or in-house), the only conservation-related cost is $5,500 for an assessment of the stones and ironwork in the cemetery. This would prepare treatment proposals and allow the town to budget for the needed treatments.

Second Priority Tasks

These tasks have a combined cost of $35,950 and are intended to be spread over years two and three.

Once the conservation assessment of phase one is completed, there will be additional conservation costs to be added, but their costs at this point are not firmly established. However, if the town desires a very approximate estimate, $30,000 could be added for critical conservation needs.

The largest single cost is $15,000 budgeted for the pruning of the trees in the cemetery. An additional $10,000 is budgeted for the mapping of the cemeteries, with special emphasis on the African American property where there are many sunken burials.

We recommend an additional $5,000 to develop informational signage for the cemetery sections, $3,900 for the construction of a rustic pathway or trail linking the two sections, and $2,000 for the replacement of a plot wall that has failed.

Third Priority Tasks

The total currently budgeted for these tasks, spread over years 4 and 5, is $38,000. However, we anticipate that conservation costs may be an additional $20,000 once the assessment has been completed.

The tasks currently identified include $20,000 for turf renovation in the cemetery, including pre- and post-emergence herbicides and overseeding with a turfgrass. An additional $10,000 is budgeted for a brochure to promote the cemeteries, and $8,000 is included for additional historical research.

Summary

Funding for cemetery related projects is limited. The best local source for information on funding opportunities will be the Heritage Alliance. They will undoubtedly suggest tapping funding from the Tennessee Historical Commission, as well as local foundations and businesses. We also recommend identifying descendants and conducting a fund drive among those with direct connections to those buried in the cemetery. Ultimately, however, much of the funding will need to come from the town through its budget process.

While we are sensitive to the current economic downturn, we must also point out that during the flush years, very little funding was devoted to the cemetery, allowing its condition to falter. Failure to step in now and remediate the conditions outlined, especially those identified as high priority concerns, will result in additional deterioration of the historic fabric. Postponing action will only result in a steady – perhaps even dramatic – escalation of the costs.

Jonesborough is ideally situated to maximize the potential of its cemetery. There is already an extensive heritage tourism base into which the cemeteries can easily tap. The presence of The Heritage Alliance also provides on-site expertise to assist in the process and guide activities.

Table 4.
Prioritization of Recommendations

Priority	Task	Cost
First – this fiscal or calendar year	1.1 The town should obtain fee simple ownership of the African American cemetery section or otherwise clear the title to ensure that they have full control.	n/c
	1.2 The town should develop a cemetery ordinance that deals with critical issues such as damage and vandalism, appropriate conduct, establishing hours of operation, and a requirement that all modifications be approved.	n/c
	1.3 The cemetery should be closed to future burials unless an individual can produce a title to a plot.	n/c
	1.4 All decisions regarding modifications, alterations, additions, or other actions affecting the cemetery should be carefully evaluated against the Secretary of the Interior's Standards for Preservation. The remaining historic fabric and context of the cemetery should be protected.	n/c
	1.5 Arrangements should be made to ensure that both cemetery sections are inspected at least weekly. This may be done during routine maintenance.	n/c
	1.6 The town should develop a policy and form for identifying, reporting, and responding to damage, vandalism, and theft at the cemetery.	n/c
	1.7 The town should work to ensure that there are routine police patrols at least to the entrance of both cemetery sections. Police should also be encouraged to park at the cemeteries while doing paperwork to maximize their presence.	n/c
	1.8 The neighbors adjacent to the two sections should be contacted with the request to report any suspicious activities at the cemetery to the police.	n/c
	1.9 All plot gates should be secured using woven stainless steel wire, attaching the gate to its hinge post.	$300
	1.10 The town should immediately implement – or fund – a maintenance program for the iron work in the cemetery that consists – minimally – of securing the gates and painting both plot fences and the boundary fence. Long-range, the town should fund a conservation program for the fences.	$40,000
	1.11 Loose ironwork at the cemetery should either be collected, labeled by plot, and stored securely or should – at a minimum – be secured to other ironwork on the plot using woven stainless steel wire.	$500
	1.12 Tree selection within the cemeteries should be focused on historically appropriate species, based on replication of identified historic species in the specific cemetery, or using period lists. Species should, however, be evaluated to eliminate those with problems such as suckers, surface roots, inherent weakness, etc. The town should develop a tree plan to ensure that when any tree must be removed, an appropriate replacement is planted in its place.	n/c
	1.13 All replacement trees should be of at least 1-inch caliper and meet the minimum requirements of the American Nursery and Landscape Association's American Standard for Nursery Stock (ANSI Z60.1-2004). Nursery stock should be carefully inspected and specimens with wounds, crooked or double leaders, broken branches, or girdling roots should be rejected.	n/c
	1.14 Trees in both cemetery sections should be inspected by a certified arborist in preparation for pruning and fertilization. Thereafter trees within the cemetery should be fertilized on a routine basis and should be professionally evaluated and pruned at least once every 5 years by an ISA Certified Arborist.	$3,000
	1.15 There are volunteer trees in several areas that, if not removed, will become problems to stones and fences. These volunteer trees should be immediately removed. Where trees are already damaging monuments, it is important to evaluate the health of the tree and its importance to the landscape. In many cases the tree will be found to be integral to the landscape and should not be removed. Fence sections and monuments can be rescued after the tree succumbs to old age.	n/c

Table 4, cont.
Prioritization of Recommendations

Priority	Task	Cost
First – this fiscal or calendar year, cont.	1.16 Shrubbery is not common and given the limited maintenance resources we do not recommend that any be planted. We did identify several shrubby masses that should be removed since renewal pruning is not feasible.	n/c
	1.17 The use of large deck mowers at the cemetery should be eliminated in favor of 21-inch push mowers which are much less likely to damage stones or scalp the turf.	n/c
	1.18 Mowers used in the cemetery should be fitted with closed cell foam bumpers to reduce the damage to the stones. These bumpers should be inspected on a weekly basis and replaced as needed.	$500
	1.19 After mowing string trimming is necessary in all cemeteries. However, we recommend that only 0.065-inch line be used in the cemetery. Heavier line is damaging the stones and cannot be safely used.	n/c
	1.20 Soil analysis should be conducted to determine if adjustments are necessary for the turfgrass. Where fertilization is needed, only organic, slow release fertilizers should be used in order to minimize salt damage to the stones.	$150
	1.21 The town should develop identification and regulatory signage for both cemetery sections. This signage should minimally deal with proper care of the monuments, prohibiting rubbings and warning visitors of their fragile condition; it should prohibit certain behaviors and actions, such as use of alcoholic beverages; it should established simple guidelines for plantings, as well as the placement and removal of floral and grave decorations; and it should include contact and emergency information.	$4,000
	1.22 The town should establish flower regulations that maintain the dignity of the cemeteries and allow reasonable maintenance. We recommend limiting flowers on graves to a maximum of 10 days. We also recommend that only cut flowers or live plants be used.	n/c
	1.23 We recommend that a stone-by-stone assessment be conducted of the Old Jonesborough cemetery. This will identify all monuments and fences in need of treatment, determine their priority for treatment, and provide costs for that work to be accomplished. This is a critical planning function.	$5,500
	1.24 All work in the cemetery should be conducted by trained conservators who subscribe to the Code of Ethics and Standards of Practice of the American Institute for Conservation of Historic and Artistic Works (AIC). This should be the minimum level of competency required by the city on all projects.	n/c
Second – over next 2 to 3 years	2.1 The town should consider options for making the entrance and exit off Main Street safer and more convenient.	n/c
	2.2 Consideration should be given to improving the parking at the African American cemetery, where there are more options for expansion. This would provide parking access for both cemeteries.	n/c
	2.3 We strongly recommend that the two cemeteries be linked by a formal, but rustic pathway about 130 feet in length.	$3,900
	2.4 The town should establish a protocol for assisting disabled clients and visitors. This should include appropriate training of staff and a means to provide access to remote graves.	n/c
	2.5 Maintenance should be improved to prevent items from being easily picked up and removed from the cemeteries.	n/c
	2.6 The one plot wall that has failed should be removed and replaced in-kind.	$2,000
	2.7 Park and Recreation should have at least one full-time individual assigned to no duties other than the care of the two cemetery sections. This one individual would need seasonal assistance during the growing season.	Cost not determined

Table 4, cont.
Prioritization of Recommendations

Priority	Task	Cost
Second – over next 2 to 3 years, cont.	2.8 Those responsible for the care of the cemetery should be encouraged to become certified by PLANET (or some similar local organization) in categories such as Landscape Technician – Exterior, Turfgrass Professional, or Ornamental Landscape Professional.	n/c
	2.9 Continuity of care, coupled with appropriate training, is especially important for the fragile cemetery landscape and monuments. This cannot be achieved with the use of prison labor and we recommend this practice be terminated in favor of dedicated staff maintenance.	Cost not determined
	2.10 Trees in both cemetery sections should be pruned for thinning or cleaning as recommended by a certified arborist.	$15,000
	2.11 We recommend that the town install Woodward (or equivalent) sanitary hydrants at the entrance to both cemeteries. These can be locked to prevent misuse and are freeze protected. This would allow repair of small lawn areas through seeding or sodding as needed.	Cost not determined
	2.12 While the filling of sunken graves is an important task, it should not be done until all such graves have been mapped. The creation of such a map is of critical importance since there are no records known for either cemetery.	$10,000
	2.13 Interpretative signage should be developed specifically for the cemetery, but if this is not possible, alternatives include either a brochure specific to the cemetery or the erection of Tennessee Historical Markers at the two locations.	$5,000
	2.14 No stones should be removed from graves without adequate documentation. The apparently "lost" stones should be researched and replaced as well as possible. Until then they should be collected and stored for safekeeping.	n/c
	2.15 There are some treatments, such as resetting, creation of new sockets, cleaning, and some aspects of fence repair, which can be undertaken by volunteers with training and oversight.	n/c
Third – over next 3 to 5 years	3.1 There remain a very large number of questions surrounding both the white and black cemeteries. The current historic research has barely scratched the surface. Additional research would begin to place the cemeteries in a more secure historical context. This research could be tied into the development of mortuary practices in Jonesborough and the study of the African American cemetery would be of special interest considering the towns importance in the abolitionist movement.	$8,000
	3.2 The cemetery has a variety of non-lawn grasses, as well as broad leaf weeds. Pre-emergent and post-emergent weed control may not be successful in the cemeteries. We do, however, recommend consideration be given to slowly renovating sections of the cemetery to promote a turf that is capable of choking out weeds and allowing the frequency of mowing to be reduced.	$20,000
	3.3 The town should be alert to the possible introduction of the imported fire ant in the cemetery sections and, if found, begin immediate control measures. The town should also be aware of the possibility of groundhogs in the cemetery and the trip hazard this can pose to the public.	n/c
	3.4 If a brochure specific to the cemeteries is developed, it should include rules, maps, brief histories, and perhaps some information on those buried in the cemeteries. While primarily intended for families and visitors, it could also be used for promotion and fund raising.	$10,000

SOURCES CITED

Anonymous

1887 *History of Tennessee*. Goodspeed Publishing Co., Nashville.

1932 *Cemetery Lawns: Making and Maintenance*. O.M. Scott and Sons, Maryville, Ohio.

1996 *Old Jonesborough Cemetery*. Governor's School for Tennessee Heritage. n.p.

Atwood, Rosanne, Jeffrey Kelly, and Ellen Lipsey

1989 *The Boston Experience: A Manual for Historic Burying Grounds Preservation*. Second Edition. City of Boston, Boston Parks & Recreation Department, Boston.

Baldwin, Thomas

1854 *New and Complete Gazetteer of the United States.* Lippincott, Grambo, & Co., Philadelphia.

Klupar, G.J.

1962 *Modern Cemetery Management.* Catholic Cemeteries of the Archdiocese of Chicago, Chicago.

Lilly, Sharon J.

2001 *Arborists' Certification Study Guide*. International Society of Arboriculture, Champaign, Illinois.

Llewellyn, John F.

1998 *A Cemetery Should Be Forever: The Challenge to Managers and Directors*. Tropico Press, Glendale, California.

Morris, Eastin and Matthew Rhea

1834 *Tennessee Gazetteer*. W. Hasell Hunt & Co., Nashville.

Parker, Jenny and Gene Cox

n.d. The Historic Cemeteries of Jonesborough. Ms. on file, The Heritage Alliance, Jonesborough, Tennessee.

West, Myron H.

1917 Establishing a Successful Cemetery Business. In *The Cemetery Hand Book: A Manual of Useful Information on Cemetery Development and Management*, Second Edition, pp. 21-26. Park and Cemetery Publishing Co., Madison, Wisconsin.

APPENDIX 1.

MICHAEL TRINKLEY

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803/787-6910

Education/Training

1974	B.A., Anthropology, University of South Carolina, Columbia
1976	M.A., Anthropology, University of North Carolina, Chapel Hill
1980	Ph.D., Anthropology, University of North Carolina, Chapel Hill
1997	Non-Destructive Investigative Techniques for Cultural Resource Management, NPS Workshop, Fort Scott National Historic Site, Fort Scott, Kansas (geophysical techniques)
1999	Jahn Installer Workshop, Cathedral Stone Products, Inc., Jessup, Maryland (3 days) (certified installer 9906811-SC)
2001	Preservation & Care of Brownstone Buildings, Technology & Conservation Conference, Boston, Massachusetts
2003	Lime Mortar Workshop, U.S. Heritage, Chicago, Illinois
2004	Preservation Masonry Workshop, School for the Building Arts, Charleston, SC (2 days)
2005	International Lime Conference, Orlando, Florida
2005	Edison Coatings Workshop, Richmond, Virginia (1 day)
2005	Historic Masonry Preservation Workshop, John Lambert, Campbell Center for Historic Preservation Studies, Mt. Carroll, Illinois (1 week)
2005	Preservation Masonry Workshop, College for the Building Arts, Charleston, SC (2 days)
2005	Masonry Analysis & Testing Workshop, Berkowitz and Jablonski, Campbell Center for Historic Preservation Studies, Mt. Carroll, Illinois (1 week)
2005	Jahn 4-Hour Workshop, Cathedral Stone Products, Columbia, SC

2006	Stone Carving and Restoration Workshop, Traditional Building Skills Institute, Snow College, Ephraim, Utah (3 days)
2007	Integrally Colored Concrete Workshop, Ron Blank & Associates, AIA Continuing Education, Columbia, SC
2008	IACET Aerial Work Platforms Training; Supported Scaffold Safety Training; Cranes, Chains, Slings and Hoist Safety Training, Columbia, SC
2008	Georgia Urban Agriculture Council & UGA Cooperative Extension Outdoor Water Use Registration Program Certificate #P86X9G4467

Memberships

American Institute for Conservation of Historic and Artistic Works
US/ICOMOS – Brick, Masonry & Ceramics Committee
Association of Preservation Technology
Preservation Trades Network
National Trust for Historic Preservation
Association of Gravestone Studies

Abstract of Cemetery Conservation/Preservation Experience (not inclusive of legal/archaeological experience):

1992	Reviewer of National Trust for Historic Preservation publication on historic cemeteries publication by Lynette Strangstad.
1998-99	Principal Investigator, Survey and Documentation of African-American cemeteries in Petersburg, Virginia. Including mapping, grave location, and development of historic context. (with Preservation Consultants, Charleston, SC).
1998-99	Conservation activities, Maple Grove Cemetery, Maple Grove United Methodist Church, Waynesville, North Carolina.
1999	Instructor, Cemetery Preservation: Making Good Choices Workshop, Virginia Association of Museums, Petersburg, Virginia.
1999	Instructor, Cemetery Preservation: Making Good Choices Workshop, Georgia Local History Conference, Augusta, Georgia.
2000	Consultation regarding maintenance and clearing of Ricefield's Woodville Cemetery, Georgetown County, South Carolina.
2000	Invited Speaker, Cemetery Conservation Techniques, Historic Cemetery Preservation Workshop, Maryland Historical Trust, Annapolis, Maryland.
2000	Preservation assessment, Summerville Cemetery, Augusta, Georgia.

2001	Assessment and preservation plan for Glenwood Cemetery, Thomaston, Georgia.
2001	Reconnaissance survey of cemeteries in Richland County, South Carolina.
2001	Preservation guidelines for St. Paul's Cemetery, Augusta, Georgia.
2001	Instructor, Cemetery Preservation: Making Good Choices Workshop, Restoration International Trade Event, New Orleans, La.
2001	Instructor, Cemetery Preservation: Making Good Choices Workshop, National Preservation Institute, Washington, D.C.
2002-2003	Conservation program, Old Waxhaws Presbyterian Cemetery, Lancaster County, South Carolina.
2003	Treatment of markers at the Vardeman Cemetery, Lincoln County, Kentucky.
2003	Consultation concerning cemetery walls and pathways, Maple Grove Cemetery, Waynesville, North Carolina.
2003	Invited Speaker, Preservation of African American Cemeteries Conference, 2003, Helena, Arkansas.
2003	Instructor, Cemetery Preservation: Making Good Choices Workshop, Washington County, Georgia Historical Society, Sandersville, Georgia.
2003	Preservation assessment, Old City Cemetery, Sandersville, Georgia
2003	Instructor, Cemetery Preservation: Making Good Choices Workshop, National Preservation Institute, Washington, D.C.
2003	Treatment of markers at Oakview and Riverside cemeteries; examination of burial vaults in white and African American sections, City of Albany, Georgia (FEMA funded).
2003	Preservation assessment, Historic Cemeteries at Five Cemeteries, Bannack State Park, Bannack, Montana
2003	Instructor, Cemetery Preservation: Making Good Choices Workshop, Bannack State Park, Bannack, Montana
2003	Consultation concerning cemetery brick wall, Midway Church, Midway, Georgia.
2004	Treatment of markers at Richardson Cemetery, Clarendon County, South Carolina.
2004	Instructor, Cemetery Preservation: Making Good Choices Workshop, National Preservation Institute, Washington, D.C.
2004	Treatment of markers at Maple Grove Cemetery, Waynesville, North Carolina.

2004	Consultation regarding State Historical Marker, Roseville Cemetery, Florence County, South Carolina.
2004	Consultation regarding the Mary Musgrove Monument, Musgrove Mill State Park, Laurens County, South Carolina.
2004	Invited Speaker, Cemetery Preservation Workshop, SC Genealogical Society Annual Meeting, Walterboro, South Carolina.
2004	Treatment of markers at Wrightsboro Cemetery, Thomson, Georgia.
2005	Treatment of markers at Pon Pon Cemetery, Colleton County, South Carolina.
2005	Treatment of markers at Walnut Grove Plantation, Spartanburg County, South Carolina.
2005	Consultant on cemetery fence theft, Save Austin's Cemeteries, Austin, Texas.
2005	Treatment of markers at Richardson Cemetery (Second Phase), Clarendon County, South Carolina.
2005	Instructor, Cemetery Preservation: Making Good Choices Workshop, National Preservation Institute, Washington, D.C.
2005	Treatment of marker in Oakview Cemetery, Albany, Georgia.
2005	Treatment of markers at Trinity Cathedral, Columbia, SC.
2005	Preliminary preservation recommendations, Randolph Cemetery, Columbia, SC.
2005	Treatment of markers in Presbyterian Cemetery, Union, SC.
2005	Instructor, Cemetery Preservation: Making Good Choices Workshop, Save Oklahoma's Cemeteries, Muskogee, Oklahoma.
2005	Instructor, Cemetery Preservation: Making Good Choices Workshop, National Preservation Institute, Las Vegas, New Mexico.
2005	Treatment of marker, Reynolds Homestead, Critz, Virginia.
2005	Assessment and preservation plan for Lewis Cemetery, King and Queen County, Virginia. King and Queen County Historical Society.
2006	Treatment of markers in Presbyterian Cemetery, Union, SC (second phase).
2006	Assessment and preservation plan for Pine Lawn Memorial Gardens, Aiken, South Carolina. SC Department of Archives and History, Columbia.
2006	Assessment of Unadilla Cemetery, Unadilla, Georgia.

2006	Invited Speaker, Planning a Cemetery Preservation Project, People and Places: South Carolina's Seventh Annual Statewide Historic Preservation Conference, SC Department of Archives and History, Columbia, South Carolina.
2006	Assessment and Preservation Plan, Memory Hill Cemetery, Milledgeville, Georgia.
2006	Assessment and Preservation Plan, Springwood Cemetery, City of Greenville & Friends of Springwood Cemetery, Greenville, South Carolina.
2006	Invited Speaker, Cemetery Rehab, South Carolina Landmark Conference, SC Department of Archives and History, Aiken, South Carolina.
2006	Assessment, Town of Dedham, MA cemetery, Vollmer Associates, Boston.
2006	Assessment and Preservation Plan, Naval Medical Cemetery Portsmouth Cemetery, Portsmouth, Virginia.
2006	Instructor, Cemetery Preservation: Making Good Choices Workshop, National Preservation Institute, Washington, D.C.
2006	Invited Speaker, Preservation Needs at Greenville's Springwood Cemetery, Greenville Chapter of SC Genealogical Society, Greenville, South Carolina.
2006	Preparation of landscape plan, Randolph Cemetery, Columbia, South Carolina.
2006	Treatment of markers in the Cason Plot, Long Creek Baptist Church, Warrenton, Georgia.
2006	Treatment of markers in the Watson Plot, Thomson City Cemetery, Thomson, Georgia.
2006	Treatment of markers at Trinity Cathedral, Columbia, South Carolina (second phase).
2006	Assessment and Preservation Plan, Old Athens Cemetery, University of Georgia, Athens, Georgia.
2006	Preparation of Treatment Plan, Terrell Tomb, Sparta, Georgia.
2006	Emergency conservation treatment, Settler's Cemetery, City of Charlotte, North Carolina.
2006-2007	Preservation Assessment and Recordation, St. Elizabeth's Cemetery, Washington, DC (for General Services Administration).
2006-2007	Preservation Assessment, three Raleigh Cemeteries, Raleigh, North Carolina.
2007	Historic research, Randolph Cemetery, Columbia, South Carolina.
2007	Treatment of Monuments at Laurelwood Cemetery, Rock Hill, South Carolina.
2007	Assessment of markers, Machpelah Cemetery, Lincoln County, North Carolina.

2007	Assessment of Moss Family Cemetery, Stanly County, North Carolina.
2007	Treatment of Monuments at the Old Athens Cemetery, University of Georgia, Athens, Georgia.
2007	Treatment of markers at Trinity Cathedral, Columbia, South Carolina (third phase).
2007	Invited Speaker, Annual Conference of the South Carolina African American Heritage Commission, Mars Bluff, South Carolina.
2007	Instructor, Cemetery Preservation: Making Good Choices Workshop, National Preservation Institute, Greensboro, North Carolina.
2007	Treatment of markers at Machpelah Cemetery, Lincoln County, North Carolina.
2007	Assessment of markers, St. Johns Cemetery, Richmond, Virginia.
2007	Preservation Assessment, Village Cemetery, Newberry, South Carolina.
2007	Instructor, Cemetery Preservation: Making Good Choices Workshop, Lincolnton Historical Society, Lincolnton, North Carolina.
2007	Treatment of markers, Settler's Cemetery, Charlotte, North Carolina.
2007	Assessment of markers, Unitarian Church Cemetery, Charleston, South Carolina.
2007	Preparation of Conservation Scope of Work (cemetery stones), Chalmette National Cemetery, Louisiana (for Lord, Aeck & Sargent, Ann Arbor, Michigan).
2007	Preservation Assessment and Assessment of markers, Mann Family Cemetery, North Attleboro, Massachusetts.
2007	Treatment of the Pringle Vault, City Cemetery, Sandersville, Georgia.
2007	Assessment of the Plunk Family Cemetery, Lincolnton, North Carolina.
2007	Assessment of City Cemetery, South Bend, Indiana.
2007	Assessment of Magnolia Cemetery, Mobile, Alabama.
2007	Treatment of the Middleton family vault, Middleton Plantation, Dorchester County, South Carolina.
2007	Treatment of ledgers in family cemetery, Augusta, Georgia.
2007	Consultant, National Trust for Historic Preservation, Southern Field Office, Tornado damage at Oak View Cemetery, Americus, Georgia.

2007-2008	Treatment of markers at Richardson Cemetery, Clarendon County, South Carolina (third phase).
2008	Assessment of the Coleman-Leigh-Warren Family Cemetery, Augusta, Georgia.
2008	Assessment of three city cemeteries, Thomasville, Georgia.
2008	Assessment of Cottage Cemetery, Augusta, Georgia.
2008	Assessment, South View Cemetery, Atlanta, Georgia.
2008	Treatment of Mitchem Family Cemetery stones, Clarendon County, South Carolina.
2008	Preparation of Conservation Scope of Work (brick, iron, stucco), Chalmette National Cemetery, Louisiana (for Lord, Aeck & Sargent, Ann Arbor, Michigan).
2008	Treatment of stones at Unitarian Church Cemetery, Charleston, South Carolina (first phase).
2008	Treatment of vandalized stones at Trinity Cathedral Church Cemetery, Columbia, South Carolina.
2008	Consultant, Dantzler Plantation, regarding brickwork, stucco, and rising damp, Holly Hill, South Carolina.
2008	Assessment, Christ Church Cemetery, Greenville, South Carolina.
2008	Treatment of stones at Magnolia Cemetery, Mobile, Alabama (first phase).
2008	Instructor, Cemetery Preservation: Making Good Choices Workshop, National Preservation Institute, Jacksonville, Florida.
2008	Treatment of Monuments at the Old Athens Cemetery, University of Georgia, Athens, Georgia (second phase).
2008	Treatment of Newman Swamp Methodist Church stones, Florence County, South Carolina.
2008	Treatment of Rehoboth Cemetery stone, Clarendon County, South Carolina.
2008	Penetrometer survey and mapping of Old Brick Church Cemetery, Fairfield County, South Carolina.
2008	Consultant, National Trust for Historic Preservation, Southern Field Office, Tornado damage at Oak View Cemetery, Atlanta, Georgia.

2008-2009	Assessment and preservation plan for three City of Suwanee cemeteries, Suwanee, Georgia (includes GPR and mapping in association with GEL Geophysics, Charleston, South Carolina).
2008-2009	Assessment and preservation plan for city cemetery, Jonesborough, Tennessee.
2008-2009	Conservation assessment of Orleans City Cemetery, Orleans, Massachusetts.
2009	Treatment of monuments at Settler's Cemetery, Charlotte, North Carolina.
2009	Treatment of monuments at Magnolia Cemetery, Mobile, Alabama (second phase).
2009	Treatment of monuments at the Old Athens Cemetery, University of Georgia, Athens, Georgia (third phase).
2009	Assessment and preservation plan for St. Elizabeths Hospital, East Camus Cemetery, Washington, DC.

National Register Nominations of Cemeteries

1999	Preliminary Multi-Property Nomination, African American Cemeteries of Petersburg, Virginia. Submitted to Virginia Department of Historic Resources, Richmond, Virginia (with Sarah Fick, Preservation Consultants).
2000	National Register Nomination, King Cemetery, Charleston County, South Carolina. Submitted to South Carolina State Historic Preservation Office, SC Department of Archives and History, Columbia.
2002	National Register Nomination, Scanlonville or Remley Point Cemetery, Charleston County, South Carolina. Submitted to South Carolina State Historic Preservation Office, SC Department of Archives and History, Columbia.
2005	Preliminary Information Form – Hopkins Family Cemetery, Richland County, South Carolina. Submitted to South Carolina State Historic Preservation Office, SC Department of Archives and History, Columbia.
2007	Preliminary Information Form – Harts Bluff African American Cemetery, Wadmalaw Island, Charleston County, South Carolina. Submitted to South Carolina State Historic Preservation Office, SC Departmen

Cemetery Preservation Plans

Historical Research

Identification of Grave Locations and Mapping

Condition Assessments

Treatment of Stone and Ironwork

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