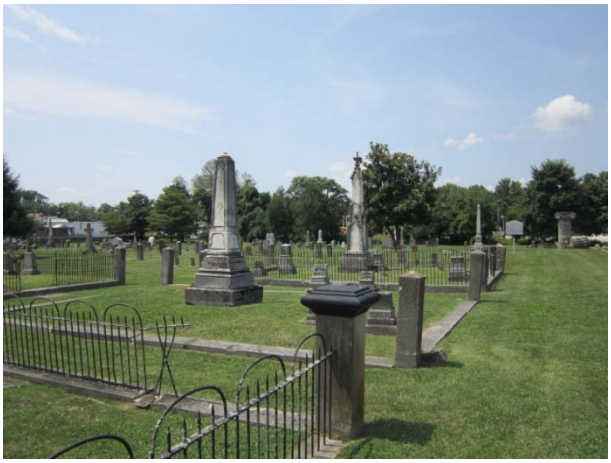
ASSESSMENT OF TWO CITY OF FRANKLIN CEMETERIES, FRANKLIN, TENNESSEE



Chicora Research Contribution 559

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Research Contribution 559

Michael Trinkley
Debi Hacker

Funded by the Tennessee Historical Commission and the City of Franklin, Tennessee

Chicora Foundation, Inc.
PO Box 8664 ▪ 861 Arbutus Drive
Columbia, SC 29202-8664
803/787-6910
www.chicora.org

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“I don't embrace excuses. I embrace solutions.”
— Jon Taffer

MANAGEMENT SUMMARY

This study was funded by a grant from the Tennessee Historical Commission. The project was administered by the City of Franklin, Tennessee and the field investigations were conducted from July 29 through 31, 2014. Report production followed immediately afterwards.

The study examines the City of Franklin's two oldest burial grounds. City Cemetery began in 1811 and was used by the area's citizens, black and white, until just prior to the Civil War. This cemetery, encompassing about 2 acres, was situated on the outskirts of the community, next to the Harpeth River. It is today bounded by North Margin Street on the south and North Third Avenue to the west. On the east is the newly completed North Third Avenue extension.

In 1855 what became known as Rest Haven Cemetery opened immediately across North Third Avenue from City Cemetery. This cemetery, about 7 acres in size, was reserved exclusively for whites. Blacks presumably continued to use the filled City Cemetery until the African American Toussaint L'Ouverture Cemetery opened in 1884.

A cemetery assessment is designed to help the cemetery caregivers to think about long-range preservation in a structured way, to better understand what is significant and why, and how it should be managed in order to preserve its historical significance and ensure the cemetery's preservation for future generations. Issues of access, roads, security, landscape maintenance, and monuments are examined. Current conditions are detailed and recommendations are offered.

Franklin, Tennessee is doing an admirable job preserving and protecting its historic houses and battlefield. The two City cemeteries could provide exceptional benefits to these efforts. Unfortunately, maintenance has been minimal and it is reported that in the past local citizens, in an effort to control rank vegetation, simply burned off the cemeteries yearly. Even more recently it appears that maintenance has been limited to mowing.

After decades of either inaction or minimal action, the two cemeteries were transferred to Franklin's Parks Department and this grant was secured.

Conditions in both cemeteries are desperate. About 20% of City Cemetery's stone boundary wall requires repair. Fully 40% of the stone boundary wall at Rest Haven requires repair or rebuilding. About 40% of the chain link fence along City Cemetery's north boundary requires extensive repairs. It is critical that a western boundary fence be constructed at Rest Haven Cemetery.

None of the iron gates associated with either cemetery are operable and the ironwork requires extensive repairs.

The condition of monuments in the two cemeteries is equally dire. At City Cemetery nearly 300 monuments – representing about 80% of the memorials at the cemetery – require conservation treatment. At Rest Haven cemetery nearly 400 monuments, or about 82% of the cemetery's total, require preservation intervention.

Nearly a quarter of the family plot fences in the two cemeteries have disappeared. Of what remains nearly a third are in poor condition and will require extensive intervention if they are to be saved. Nearly half can be rated, at best, as in only fair condition. Only 3 fences, or less than a quarter, are considered to be in good condition.

Overwhelming deterioration, whether it represents failing walls, falling fences, or broken monuments, affects the entire cemetery landscape, making these properties less attractive places and reducing the heritage tourism potential of these properties. Moreover, it ignores that the

City is the steward of these cemeteries, holding and maintaining them for future generations. Simply put, after years of deferring preservation activities, the City of Franklin is facing a massive maintenance responsibility.

This assessment has identified five critical preservation issues at the two cemeteries.

First, while maintenance operations have already improved at both cemeteries, additional actions are necessary. Among these maintenance improvements are developing a dedicated, full-time cemetery maintenance staff. Devoting 1½ days a week to mowing these properties, with less than a 30 minutes a week oversight by the Grounds Foreman and Crew Chief, will simply not permit adequate maintenance.

Second, it is critical that the porous boundaries of the two cemeteries be improved. The stone walls must be repaired. The chain link fence at City Cemetery must be repaired. A new fence must be erected along the western boundary of Rest Haven Cemetery. The iron work associated with these two cemeteries must be repaired before it is so badly damaged that repair becomes impossible.

Third, the family plot fences, which are an important cemetery landscape feature especially at Rest Haven, must receive intervention. In some cases extensive repairs will be necessary, including structural modifications. In other cases, simple caulking and painting will provide years of preventative conservation.

Fourth, the condition of the stones in the two cemeteries is so deplorable that immediate actions are essential. It will be difficult to effectively encourage or integrate heritage tourism given the overall poor condition of these critical landscape features.

Finally, the City must post regulatory signage at every cemetery entrance to ensure that they have control over the properties.

We acknowledge that the recommendations will be costly. Nevertheless, the City of Franklin has deferred care for generations – it is now time to ensure that these early Franklin cemeteries are appropriately preserved for future generations.

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Introduction

This study examines two City of Franklin owned and maintained cemeteries in Williamson County, Tennessee (Figure 1). Separated by what is today Fourth Avenue North these are City Cemetery to the east and Rest Haven Cemetery to the west.

City Cemetery was began ca. 1811 and continued in use until Rest Haven Cemetery was created on the opposite side of Fourth Avenue North ca. 1855. Situated largely in the flood plain of the Harpeth River, the two cemeteries exhibit a gradual slope from about 630 feet above mean sea level (AMSL) on the southern edge of City Cemetery to about 620 feet AMSL at the northern edge of Rest Haven Cemetery.

City Cemetery is identified as parcel 063N

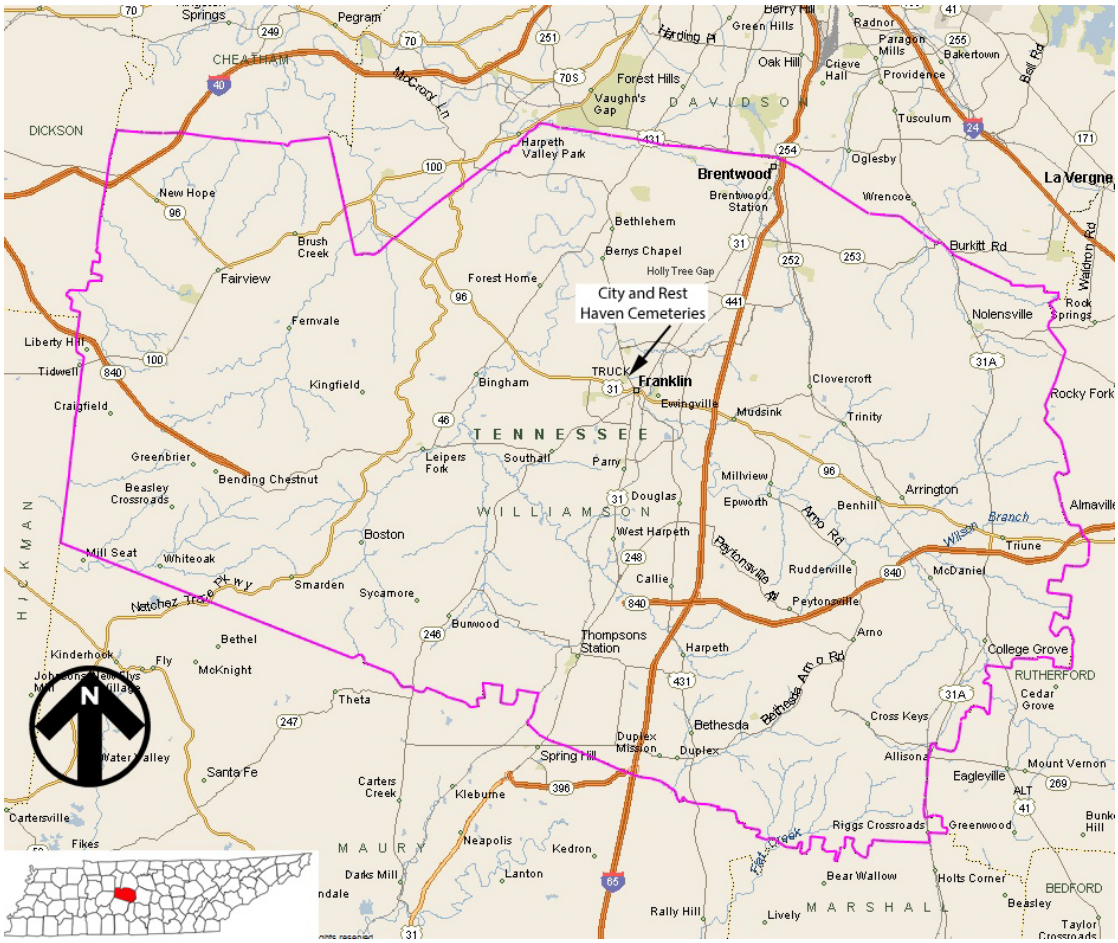

Figure 1. City of Franklin in Williamson County, Tennessee.

Figure 2. Aerial photograph of City and Rest Haven cemeteries.

D 00600 and is listed as 1.9 acres, very close to the 2 acres claimed by the deed. Rest Haven Cemetery is parcel 063N D 01400, identified as 6 acres (Figure 2). Burials appear to be limited to the southern 3.7 acres of the parcel and if the area to the north was used there is no visual indication today.

In spite of both cemeteries being listed on the National Register in 2012, there has never been any detailed inventory of extant graves. It is estimated that City Cemetery contains between 285 and 373 marked graves in the western half, as well as perhaps 300 unmarked graves of African Americans in the eastern portion of the cemetery. Rest Haven is thought to contain at least 475 marked burials, perhaps more, although this cemetery excluded African Americans.

In spite of the uncertain number of burials – or perhaps because of this uncertainty, both cemeteries are considered closed. There are no maps or burial registers for either property, although the City is anticipating the use of ground penetrating radar (GPR) in an effort to further explore various "open" areas.

As previously mentioned, both cemeteries were placed on the National Register of Historic Places in 2012 and are considered significant under Criteria A (association with events) and C (embodies distinctive characteristics). The burial

Figure 3. City (top) and Rest Haven (bottom) cemeteries along the Harpeth River.

monuments reflect funerary traditions from the early-nineteenth century through the first quarter of the twentieth century. A variety of architectural styles are found in the obelisks, headstones, and other markers.

The landscape architecture of the City Cemetery is characteristic of early churchyard cemeteries with rigid geometric formality. There is little evidence of early garden styles and only a few defined family plots, although often family members are found as groups of burials. The cemetery is, however, situated on the outskirts of Franklin, typical of the town/city cemetery movement away from populous areas.

While established much later, Rest Haven Cemetery exhibits a continuation of town/city cemetery landscape begun at City Cemetery and lacks any clear indication of the rural cemetery movement. The cemetery is, however, dominated by defined family lots, generally 30 by 20 feet.

Consequently, both cemeteries document transition periods between the churchyard, town/city, and rural cemetery. It demonstrates that not all communities quickly, or convincingly, adopted common cemetery styles and many retained a basic conservative approach.

The Project

There have been at least two previous assessments of the cemeteries. The first, from 2006, was conducted by Ilene R. Tyler and Tracy L. Coffing with Quinn Evans Architects as part of the City's study of the area for Bicentennial Park (Tyler and Coffing 2006). While very brief, the study does provide insightful recommendations. It does not appear, however, that the City acted on any of the recommendations.

The second study was conducted in 2010 by five students from the Middle Tennessee State University (MTSU) Center for Historic Preservation. This document provides updated information on conditions and, in particular, provides the only detailed historic documentation other than the brief National Register nominations available for the two cemeteries (Eubank et al.

2010). The document also includes as an appendix the WPA transcriptions for both cemeteries, a very useful document given the amount of damage seen at both properties. Although not incorporating specific recommendations, this study does provide good overviews.

It was about 2012 that care of the cemeteries was transferred from the Street Department to the City's Park Department. By 2013 Ms. Anna Shuford contacted Chicora seeking information on our cemetery assessment program. A scope of work was issued by the City in March 2014 and Chicora submitted a proposal for the work in April. An agreement was reached by early June 2014.

The assessment was conducted from July 21 through 31 by the authors, Michael Trinkley and Debi Hacker. The work involved a three day inspection of the two cemeteries. The work included not only a careful inspection of the overall condition, but also a series of meetings with representatives of the City of Franklin Park Department, including Ms. Anna Shuford, Mr. James Bilbo, and Mr. Brian Walker, as well as the City's Preservation Planner, Ms. Amanda Hall.

This document may be viewed as a "comprehensive or master plan" in so far as it is a long-range plan that provides a policy framework to guide preservation planning decisions. We view long-range as ideally five years, believing that after that length of time progress should be evaluated and needs of the cemeteries re-assessed. This document is not, however, a business, financial, or fundraising plan, although each of those topics impacts preservation and will be at least briefly examined.

This preservation plan incorporates issues of not only maintenance of the landscape, but also security, pedestrian and vehicular access, vandalism, and maintenance of the cemeteries' hardscape. The assessment also includes a review of critical conservation issues associated with monuments, plot fences, and surrounding walls.

The presence of a plan, however, does not guarantee improvement. This document is a "road-map" for preservation issues, but it is incumbent on the City's Board of Mayor and Aldermen to not simply implement its recommendations, but to embrace them. Many of the recommendations focus on fundamental operational changes.

Yet failure to make substantive changes will have serious effects on the long-term quality of the landscape, the cemetery monuments, and community support of the two cemeteries.

Why Preserve?

Preservationists may take the question "why preserve" for granted; yet it remains an important issue, especially in the current economic climate. It is useful to provide at least some brief discussion of why preservation of Franklin's two historic cemeteries is a worthwhile – even critical – goal for the city and its citizens.

Cemeteries are different from all other types of historic sites. Most fundamentally they contain the physical remains of past generations and are considered sacred, consecrated ground. The right to a decent burial has long been recognized in common law. So, too, is the duty to continue a cemetery once begun. Thus a municipality or other organization, by opening a cemetery, creates a duty through its officials to execute the trust and maintain the cemetery for the benefit of the public. This is a fundamental responsibility of the Board of Mayor and Aldermen.

Cemeteries are also artistic sites, such as a sculpture garden or outdoor museum, which contain a collection of three-dimensional artifacts. The monuments trace changes in both designs and social attitudes toward religious and moral views, death and eternity. They provide examples of the largely disappeared art of stone carving, illustrating numerous famous artisans. They are permanent collections, but must be considered finite and irreplaceable.

These collections are archives, having the same value and importance to the community as any paper archives. They are storehouses of genealogical information that often cannot be identified through any other means. They provide information concerning both the individual and collective pasts.

Sometimes it is thought that once a genealogical assemblage of the cemetery is collated and published, archival concerns have been fulfilled. This is incorrect. Few such compilations include detailed photographs and full transcriptions, including verses.

In addition, part of this archive is the archaeological and bioanthropological information the cemetery contains – even if the burials are never excavated. The graves and tombs can provide information on mortuary behavior, such as the coffins and hardware chosen by relatives. The human remains can provide information on diet, disease, and burial practices – information that is available from no other source.

Cemeteries are also scenic landscapes, similar to parks or open spaces, except they are much more. They are far more fragile and susceptible to damage and deterioration. As such they require distinctly different care.

Thus, cemeteries are important social, historic, architectural, and archaeological artifacts. When there is little else physically remaining of a community's earliest history, there will often be a cemetery that provides a unique tie to the community's collective past that would otherwise be lost.

Beyond these ties to the community's history and the ethical responsibility of caregivers, the preservation of our past also has clear economic benefits to a community. These serve to dispel the argument that while history may be important, there are more pressing needs. History can, in fact, generate the economic stimulus to help address the other needs of a community.

Taking just a few examples from the numerous studies available:

- Historic preservation activities generate more than $1.4 billion of economic activity in Texas each year.
- Rehabilitation of historic properties in Georgia during a five-year period created 7,550 jobs and $201 million in earnings.
- Each dollar of Maryland's historic preservation tax credit leverages $6.70 of economic activity within that State.
- In one year, direct and indirect expenditures by heritage tourists in Colorado reached $3.1 billion.
- A New York state study found that prices of houses in historic districts are higher than those of similar houses outside historic districts.
- A detailed Massachusetts study found that heritage tourism travelers spend "considerably more" than other travelers and that most come from out of state, further accentuating the economic contribution of heritage tourism. The study found that heritage tourists contributed an estimated $2.5 billion annually over the 1998 through 2000 period. Considering both direct and multiplier effects, Massachusetts received annually from heritage tourism 53,000 jobs; $1.2 billion in income; $1.8 billion in gross state product; $559 million in taxes (including $301 million in state-local taxes); and annual in-state wealth creation of about $1.5 billion.

Thus, we see a broad range of reasons why we should be concerned about the preservation of City and Rest Haven cemeteries. We argue, in fact, that the significance of cemetery preservation is actually greater than the sum of its parts.

Preservation or Restoration?

Preservation 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 too often knows little of the Secretary of the Interior's Standards for Preservation and may care 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 1989:245)

Ruskin also crisply stated 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 (Ruskin 1989:241).

In contrast, preservation (or conservation for that matter) can be defined as preventing or delaying loss, depletion, waste, or harm. Preservation seeks to limit natural deterioration.

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

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 thinking about as they begin a cemetery preservation plan. Those responsible for the care of City and Rest Haven cemeteries 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. 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?" 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

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.

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). If volunteers are to be used, they must be thoroughly trained and carefully supervised to ensure that correct methods are used.

The Secretary of the Interior reminds those responsible for the resources that each and every cemetery has evolved and represents different styles and forms. Few, if any, cemeteries are "frozen in time." For example, Franklin's cemeteries, while originating in the antebellum period, contain examples of a variety of later memorials, including late nineteenth and early twentieth century granite die on base monuments. The landscaping provides transitions from a churchyard style to a city cemetery with some indications of rural cemetery influence.

It is the responsibility of care-givers 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.

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 (a problem with virtually all "restoration" efforts).

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 dry laid rock walls, they would be failing as good stewards if they allowed synthetic stone on concrete masonry units – especially if the only justification was because new wall was less expensive or easier to maintain.

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 the City and Rest Haven cemeteries. The cemeteries have been fighting gradual – and at times exponential – deterioration since at least the early twentieth century. One previous assessment has characterized the monuments in City Cemetery as in "fair to poor condition," they note that many stones at Rest Haven have been moved from their original locations "and piled against the east wall (Tyler and Coffing 2006:6, 14). More recently, it was noted that "virtually all of the tombstones in the Old City Cemetery are in poor condition," the result of years of neglect (Eubank et al. 2010:56).

Attention to the Secretary of Interior Standards for Preservation is even more critical today since Franklin's cemeteries have recently been listed on the National Register of Historic Places. There is no longer an option for "business as usual." The City must embrace these Standards and we recommend that a working meeting be held during which the standards are fully explained to all participants and care-givers.

A Brief History

While some brief history is provided by the National Register nominations, the best historical synthesis is offered by Eubanks et al. (2010) and this document will be relied on for this historic context.

The City Cemetery, situated at the edge of Franklin, was purchased by the City from Joel Parrish in 1811. The calls from the deed (quoted in Eubanks et al. 2010:4) provide a near perfect match for the cemetery as it exists today. The deed specifies the parcel was 2 acres; the calls result in a parcel 1.995 acres (Figure 4).

After only four years, Eubanks et al. (2010:4) note that the cemetery "became the church yard of the First Presbyterian Church" built northwest of the cemetery. No additional information concerning this was provided, leaving unaddressed if the city sold part of the cemetery or whether the church simply began using the available cemetery.

It is also reported that the western third of the cemetery is the oldest, with many of the early graves in this area. In the eastern third are very few marked graves, although depressions suggest that the cemetery is fully occupied. A number of African Americans, including Catherine

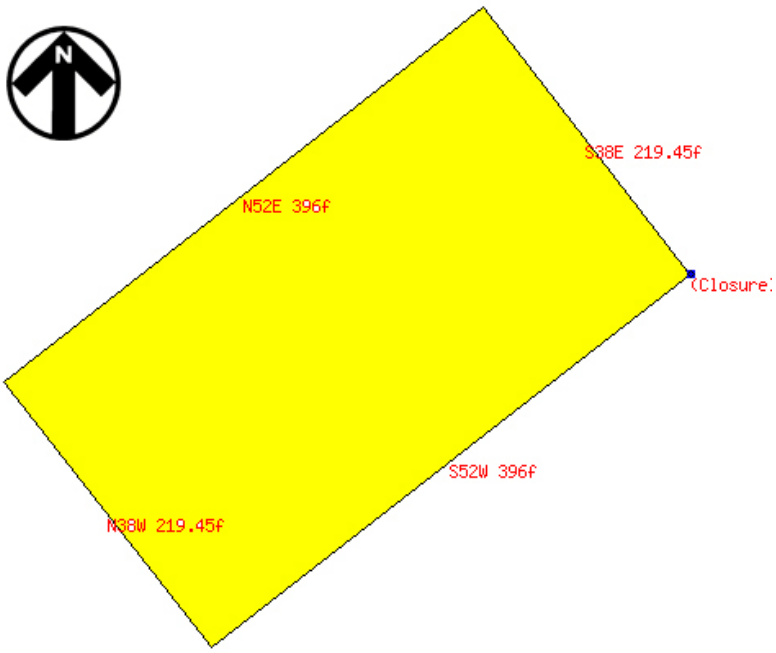

Figure 4. Plat of City Cemetery based on the calls identified in the deed.

Brown, Daniel Brown, Lena Brown, Letitia Brown, Anarchy Cowles, Harvey Otey, and Phebey Otey, are found in the eastern quadrant of the cemetery. It has been assumed that the eastern portion of the cemetery was used by the poor and African Americans. With a third of Williamson's county population being African American in 1820, it is likely that such a burial place was in great need.

Although burials continued until 1936, by the 1850s the cemetery was recognized as being full. In 1855 John Marshall sold 7.928 acres to the City (Williamson County Deed Book V, pg. 444). At the time this parcel was described as being covered in large part by the "New Cemetery," suggesting that not only was all of the lot not cemetery, but that the "new cemetery" actually began prior to the purchase of the property in 1855. This is supported by the earliest known burial on the tract occurring in 1842.

In 1860 the City ordered the construction of a wall for the north, south, and west sides of the cemetery, while the east side, bordering what was then Indigo Street and today Fourth Street North, was to remain a board fence. Unlike City Cemetery before it, the "New Cemetery" excluded African Americans. Since the Toussaint L'Ouverture Cemetery for African Americans wasn't chartered until 1884 (although the first burial occurred in 1864), it is unclear where Williamson County blacks were buried. It seems likely that the heavily used City Cemetery continued to be used until burials began at what became Toussaint L'Ouverture Cemetery.

When the "New Cemetery" became known as Rest Haven is not documented. By 1916, the Old Glory Chapter of the Daughters of the American Revolution (DAR) engaged in a cemetery improvement project, part of which included the construction of the wall surrounding City Cemetery and perhaps completing the wall along the east side of the "New Cemetery." If so, this cemetery was known as Rest Haven at least by this date since the name is incorporated in the pillars at either side of the entrance.

The 1878 D.G. Beers *Map of Williamson County, Tennessee* includes an inset of Franklin (Figure 5) that shows the "Old Cemetery" and "New Cemetery," suggesting that the name "Rest Haven" had not been adopted by that time.

The 1909 Franklin topographic map fails to show either cemetery – a seemingly major failure considering the importance of these city cemeteries.

By 1927 the *City of Franklin* map shows both cemeteries simply identified as "Old Cemetery" and showing both seemingly filled (Figure 6).

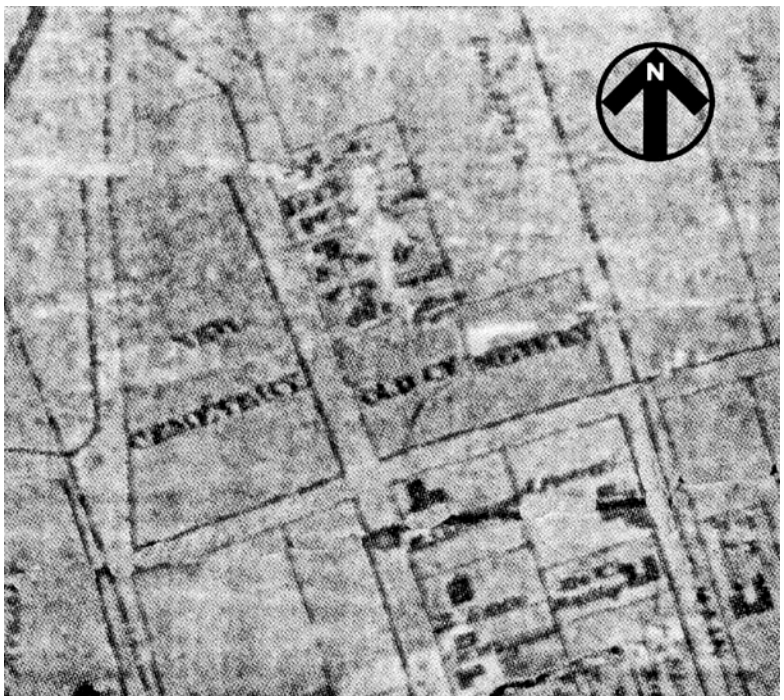

Figure 5. A portion of the 1878 D.G. Beers *Map of Williamson County, Tennessee* showing the two Franklin cemeteries.

Although uncited, it appears that maintenance at the cemeteries was frequently lacking. At some point in their history, families simply chose to burn off the tracts rather than attempt to mow them. In 1948 there is an oblique aerial showing the Harpeth River flooding up to the boundaries of the cemeteries.

A 1953 aerial photography, although of poor quality, allows both cemeteries to be recognized and shows them to have very similar vegetation. Since there is no evidence of monuments, it is likely this vegetation is relatively high, consistent with the suspected lack of maintenance.

Burials at Rest Haven largely ceased in the late 1960s, although one occurred as late as 2009.

These brief comments serve to reveal that much more research should be devoted to these two properties. In particular, period newspapers should be examined for evidence of activities, especially activities related to the opening and closing of the cemeteries, and the care they were receiving. City records, such as the minutes of the Board of Aldermen, should be carefully reviewed to determine what sorts of cemetery activities were being discussed.

An undated and unsourced map indicates that plots at Rest Haven were being sold for $20, so it is likely that additional information would be available if it were simply sought.

While additional research is not a necessary prerequisite for long-term preservation planning, it would certainly assist the City in telling the story

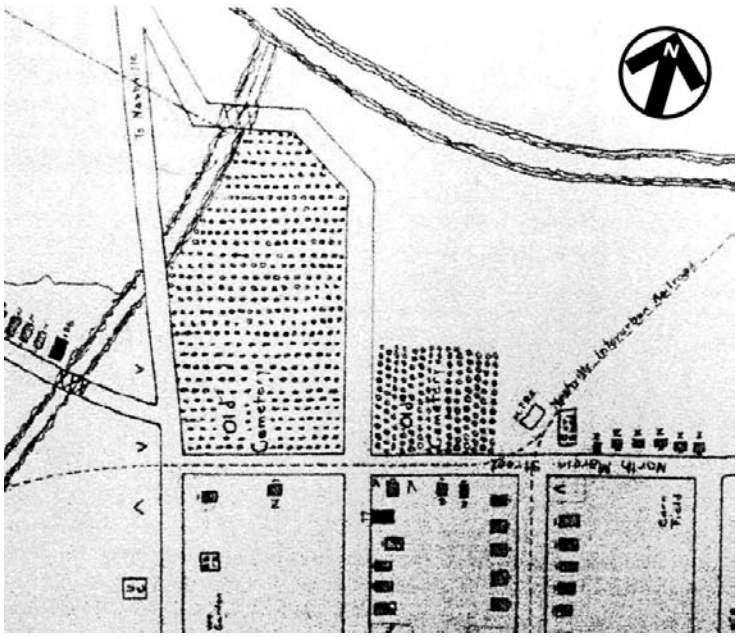

Figure 6. A portion of the 1927 *City of Franklin* map showing the vicinity of the Franklin cemeteries.

Figure 7. Portion of an oblique 1948 aerial showing flooding up to the boundary of the two cemeteries.

of these two cemeteries.

The Cemetery Location, Setting, and Context

City and Rest Haven cemeteries, once at the northern edge of Franklin, are today surrounded by development. South and west of Rest Haven are a number of retail tracts and Hillsboro Road, a major arterial route, has recently been improved to accommodate more traffic and likely spurring more development. In 2010, Hillsboro Road in the vicinity of the cemeteries was noted as reaching an unstable flow pattern. The 2013 Annual Average Daily Traffic (AADT) count at Hillsboro just south of its intersection with Fourth Avenue North is 16,491. A nursery and fruit stand is located north of City Cemetery and east of Rest Haven. Both cemeteries are located at the edge of Bicentennial Park with uncertain future activities. To the south of City Cemetery are retail, commercial, and mixed residential lots.

Unfortunately, there is relatively little vegetative screening, especially to the west of Rest Haven, and the 4-lane Hillsboro Road has a significant visual and noise impact on the cemetery. No screening exists to shelter either cemetery from activities to the south, many of which are also intrusive to the National Register properties (Figure 9).

Efforts to address the traffic problems include a bus system (Franklin Transit Authority) and a variety of bike routes. The closest bus route is along Hillsboro Street to the west of the cemeteries. There are no bike lanes in the immediate vicinity of the cemeteries. In spite of this we observed at least one group bike into City Cemetery for a tour.

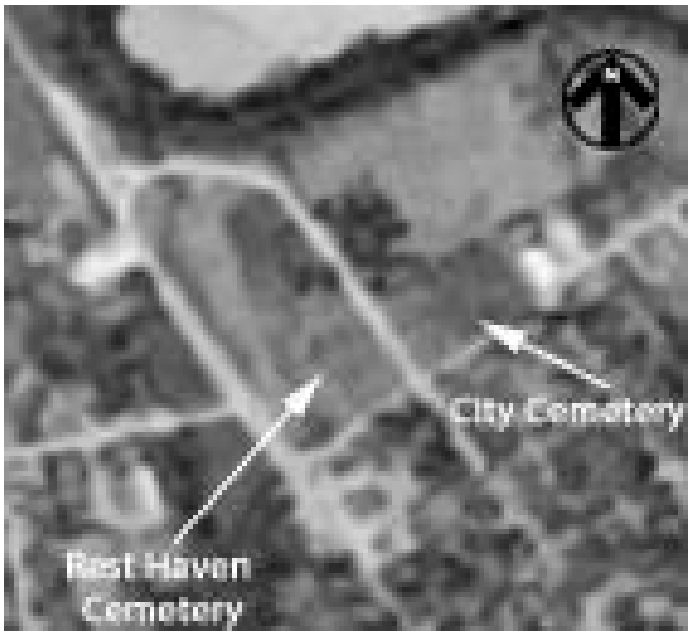

Figure 8. Portion of the 1958 aerial ARA001080556176 showing the two cemeteries.

Figure 9. Intrusive elements in the vicinity of the cemeteries. Upper left shows Hillsboro Road from Rest Haven. Upper right shows the proposed parking lot on Hillsboro Road from Rest Haven. Lower left shows the Bicentennial Park building from City Cemetery. Lower right shows commercial development south of Rest Haven Cemetery.

There are no vehicular entrances to City Cemetery, although pedestrian gates are present on the west and south sides, with one recently added on the east side. A vehicular gate for Rest Haven is present on the east side, although it is currently chained closed. Pedestrian gates exist on the south and north sides of the property. Both cemeteries have very porous boundaries, an issue discussed in greater detail in a following section.

Franklin is situated in what is known as the Central Basin, also known as the Interior Plateau. This is a diverse physiographic and ecological region that extends from southern Indiana and Ohio to northern Alabama. Rock types are distinctly different from the coastal plain sands of western Tennessee and include limestone, chert, sandstone, and siltstone. Elevations are lower than the Appalachian region to the east; topography is extremely level and has an average elevation of 650 feet above mean sea level (AMSL). Relief in most areas is less than 50 feet. The few hills and knobs that rise above the landscape are commonly less than 100 feet in height. The cemeteries exhibit a gradual slope from about 630 feet AMSL on the southern edge of City Cemetery to about 620 feet AMSL at the northern edge of Rest Haven Cemetery.

The natural vegetation is primarily

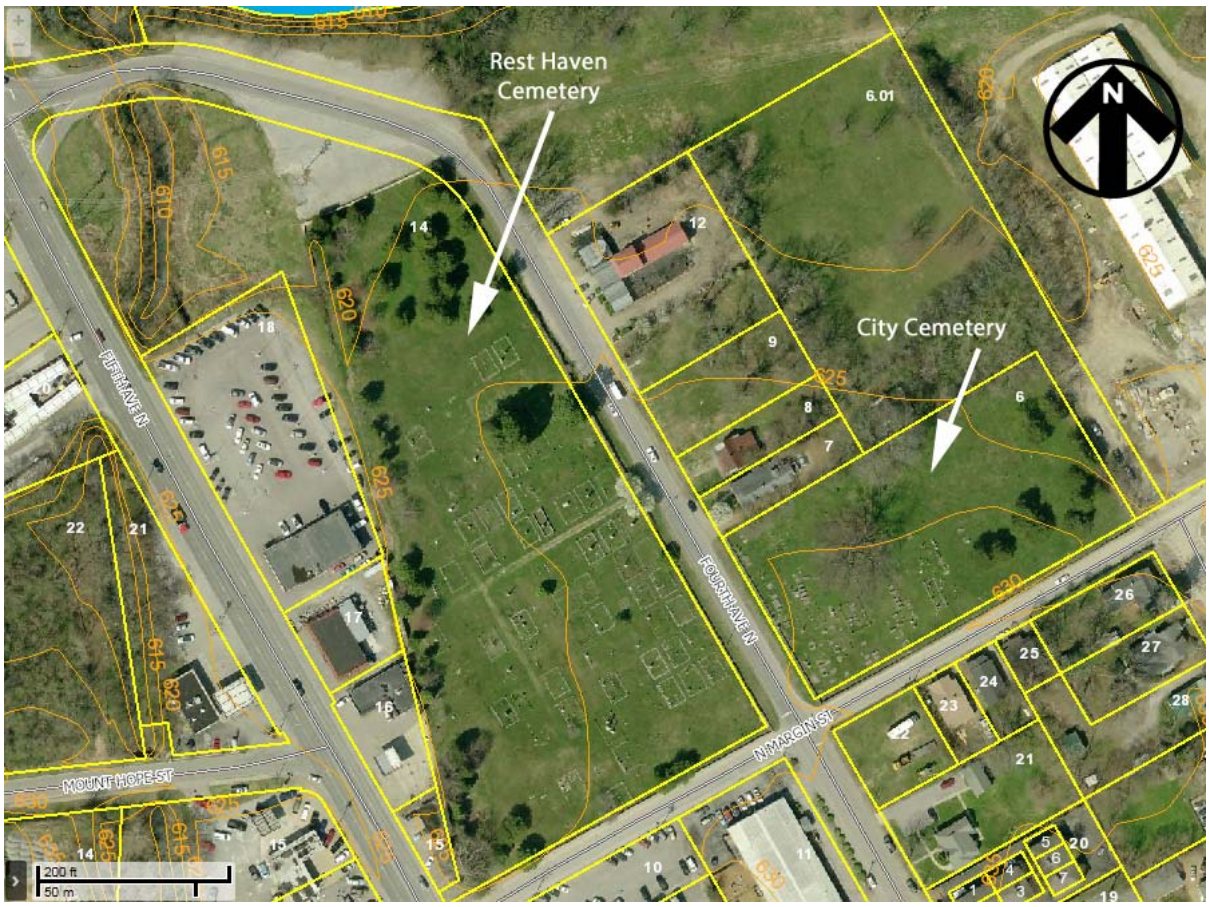

Figure 10. Contour map of City and Rest Haven cemeteries in Franklin.

oak-hickory forest. The cemeteries, however, are dominated by an urban environment of grass, pines, pecan, hemlock, cedars, and magnolia.

It is only with some effort that the original rural nature of these two cemeteries may be appreciated. This rural flavor may, however, be reclaimed by limiting future development in the vicinity of the cemeteries and judicious use of screening vegetation. The spatial arrangement of City Cemetery is dominated by a geometric arrangement; Rest Haven by a similar gridded arrangement, as well rectangular plots, and abundant ironwork. Both cemeteries are also characterized by their low limestone walls. Vegetation in both cemeteries is limited.

The cemeteries are at the north edge of census tract 508, which encompasses most of downtown Franklin (Figure 11). The value in examining these areas is that they surround the cemetery and can affect it in terms of community support.

The population in 2010 was 62,487, with an estimated increase to 68,886 in 2013. Most of the residents (84.4%) are white and only 6.7% are African American. Education levels exceed those for Tennessee in general, with 94% of the county's residents having a high school degree, and over half (54.1%) having a B.A. degree. In contrast, only 23.5% of Tennessee resident has a college degree.

Residents are also comparatively wealthy. The median value of owner-occupied housing units for Franklin is $309,400 compared to $138,700 statewide. The median household income in Franklin is $79,894, while that for

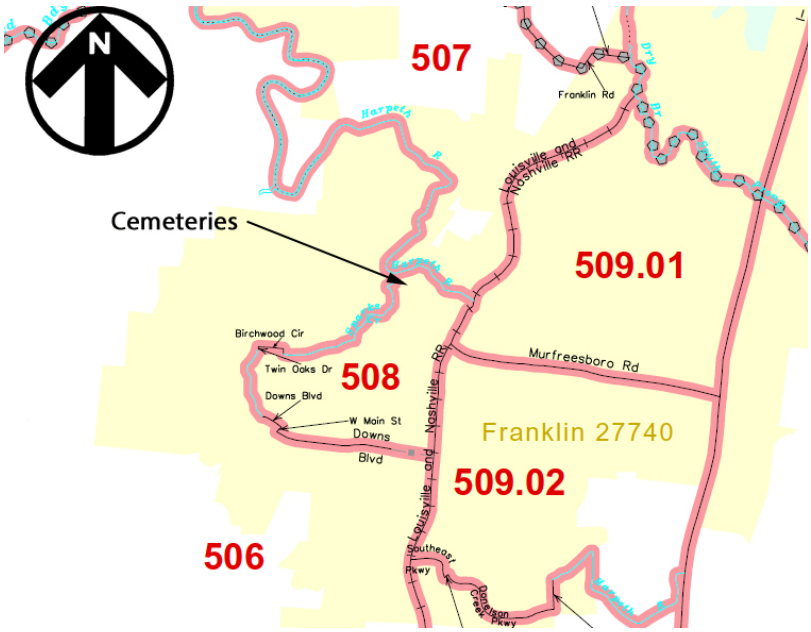

Figure 11. Census tracts in the Franklin, Tennessee area.

Tennessee is only $44,140. While only 7.7% of Franklin residents are below the poverty level, 17.3% statewide fall below that threshold.

Franklin's residents are typically white, well educated, and comparatively wealthy. This is the demographic typically identified as most supportive of historic preservation and heritage tourism.

The 2012 index crime rate per 100,000 people in Franklin was 1,783. This is significantly lower than for Tennessee as a whole, where the 2012 crime rate was 4,015 per 100,000. Property crime, which is most likely to affect long-term cemetery preservation, was very high, 1,619 per 100,000, although this too is lower than for Tennessee as well (3,371 per 100,000). Franklin has relatively few law enforcement employees (2.5 per 100,000 compared to the state average of 3.5). This may have an impact on the Police Department's ability to respond to vandalism issues at the cemeteries.

We were unable to find a count of the current homeless population in Williamson County, although it appears that in 2010 the number was listed as only 15. City representatives do not believe that they have a significant homeless issue in the cemeteries at present.

Factors Affecting the Landscape Character

As previously discussed, Franklin is situated in Tennessee's Central Basin or Interior Plateau. The topography is level and most of the rocks are limestone – evidenced throughout the region in the numerous walls.

Only three soils series are present in the two cemeteries (Figure 12). The most common soil, found in both and accounting for over 80% of the parcels is Armour silt loam, 2 to 5% slopes. This is deep, well-drained soil developed in phosphatic alluvium on stream terraces and foot slopes, especially along the Harpeth River. A typical profile reveals about a foot of dark brown friable silt loam overlying a brown or dark brown friable, silty clay loam to a depth of about 3 feet. It is generally fertile and often cultivated.

Armour silt loam, 0-2% slopes is found at the southeast corner of Rest Haven and the south corner of City Cemetery. This soil is almost identical to the Armour soils with a slightly greater slope, except that they are typically found on broad, level stream terraces.

The last soil series is the Lindside silt loam, phosphatic. This is a deep, moderately well-drained soil found on the first bottoms of streams that flow through phosphatic limestone uplands. This soil also exhibits about a foot of dark brown friable silt loam overlying about a foot of grayish-brown friable silt loam. Below this is a mottled gray and brown silt loam or silty clay loam. This series may exhibit a relatively high water table with ponding, especially in the winter

Figure 12. Soils in City and Rest Haven cemeteries.

walls and monuments might be possible, depending on water flow. Water is rarely just water and it is also possible that known hazardous and toxic materials may migrate into the cemetery soils as a result of flooding.

Of equal importance, the flood would cut off access to the cemeteries and the damage to the community would likely delay disaster recovery in the cemeteries.

and spring. It was this condition that probably resulted in using this portion of City Cemetery for the poor and African Americans.

Franklin is characterized by mild winters, warm summers, and abundant rainfall. Seasonal, and even daily, variations in humidity can be

As Figure 13 reveals, both cemeteries are entirely within the 100-year flood zone. While the 1948 flood (Figure 7) was not a 100-year event, the 2010 flood crested at 35.11 feet, breaking the old record of 33.6 feet. It is reported that both cemeteries were under up to 3 feet of water.

While the 2010 event was the most severe recorded, major floods have occurred in 1929, 1948, 1955, 1960, 1962, 1973, 1975, and 1979 (U.S. Army Corps of Engineers 2012).

Given the age of the cemetery, it is unlikely that flooding would cause vaults or caskets to float, but damage to

Figure 13. FEMA 100-year flood zone at City and Rest Haven cemeteries.

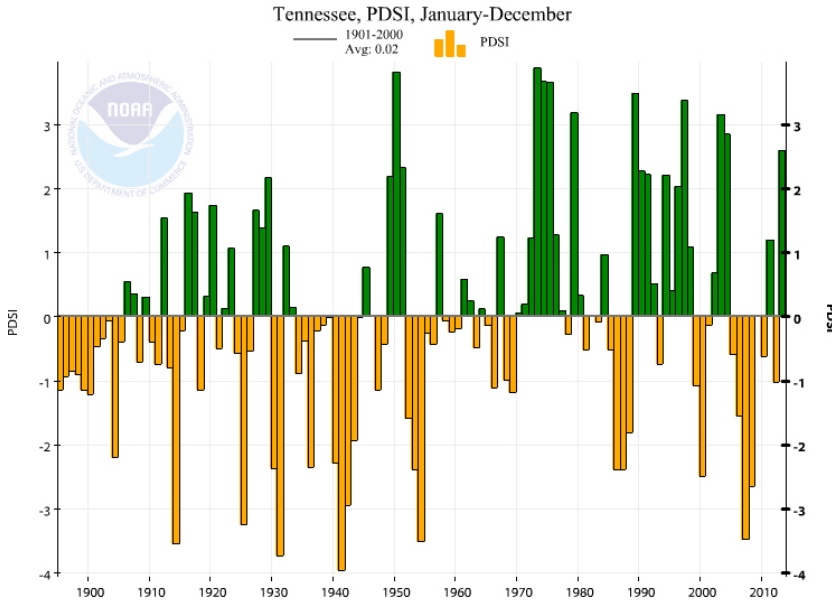

Figure 14. Palmer Drought Severity Index for Tennessee.

significant. The average annual relative humidity is 70%. The average annual temperature is 57°F. Winter temperatures range from the mid 20s to the mid-50s, while the summer temperatures are in the high 80s.

Typically abundant precipitation is distributed fairly evenly throughout the year, with an average annual precipitation of about 48 inches. Figure 14, however, reveals that Tennessee exhibits considerable potential for drought. On a finer scale, Middle Tennessee received above normal precipitation during 2013, although thus far in 2014 the precipitation has been near normal in the area. This is important since droughts can have a significant impact on plantings, even native tree species.

While Tennessee has had 1,131 tornadoes since 1950, Williamson County has had only one documented event. The F1 tornado occurred on April 21, 1972 just northeast of the cemeteries on the bank of the Harpeth River.

The area has an average growing season of about 191 days, although this will vary by specific location, with low areas often evidencing late frosts. Figure 15 shows that all of Williamson County is situated in Plant Hardiness Zone 7a, where the minimum temperatures are expected to be between 0 and 5°F. Since this "new" planting zone map was released the zones have shifted even further northward, potentially placing City and Rest Haven cemeteries in Zone 7b.

This is also a transition zone where both warm and cool season turf grasses may grow, depending on local conditions. Typical grasses include Bermuda, Zoysia, and fescue.

A factor not only affecting the landscape but also stone preservation is the level of pollutants. Based on monitoring in the region, the annual mean of NO_2 is 0.042 ppm and the annual

Figure 15. Plant Hardiness Zones in the vicinity of Williamson County, Tennessee.

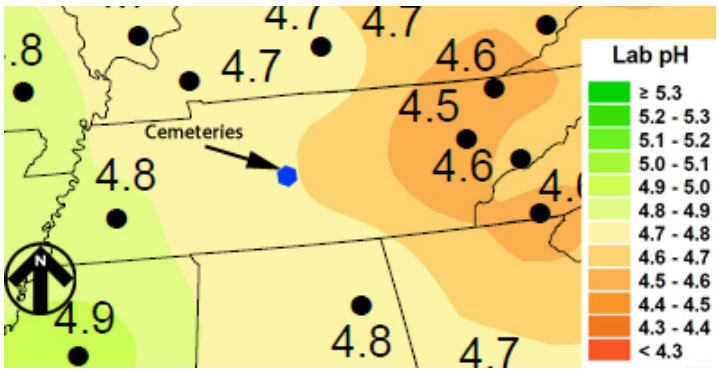

Figure 16. Rainfall pH in Tennessee.

mean of SO_2 is 0.010 ppm. These levels result in significant levels of acid rain and deterioration of marble and many sandstones. Figure 16 shows the impact of these pollutants on rainfall, with pH averages of about 4.7.

There are two sources of EPA regulated air pollution within 0.5 mile of the cemetery. To the north is Superior Cleaners and to the south is Franklin Laundry. A third source, the Georgia Boot Plant to the east, recently closed. There are 12 nearby sources of hazardous waste. The closed Georgia Boot plant was also a source of hazardous waste and toxins. These locations are important since prevailing winds are from the south, pushing any releases into the cemetery with relatively little dilution. Less mobile are three areas of hazardous waste and associated land contamination within a half mile of the cemetery.

This review reveals that the cemetery faces a variety of natural and man-made environmental factors, all of which have the potential to impact monuments, the cemetery hardscape and the cemetery vegetation. Long-term preservation involves balancing all of these concerns.

The only way for cemetery caregivers to deal with all of these potential events is to develop a detailed cemetery disaster plan. Just as museums, libraries, archives, and businesses must have plans to deal with floods, loss of electrical power, hurricanes, and weather events, cemeteries too must be ready to respond when there is a significant event – either weather-related or caused by humans.

Chicora Foundation has developed a detailed manual to assist cemeteries in disaster planning, but it is critical that Oconee Hill take the threat seriously and conduct the planning in order to respond in an effective and timely manner.

Recommendations

- A joint meeting of Park staff and the Battlefield Preservation Commission should be devoted to a careful review of the Secretary of Interior Standards. The caregivers should focus on a fuller understanding of how daily operations affect the long-term preservation of the cemeteries, making necessary adjustments to current policies and procedures. A presentation should then be prepared for the Board of Mayor and Aldermen.

- Historic research should focus on the newspaper and city records to obtain a fuller understanding of the cemeteries and their use.

- The City should prepare a disaster plan to cover events such as flooding and tornadoes.

Administrative Issues

In this section we will examine a broad range of administrative issues that affect preservation efforts, including the laws protecting the cemetery, and cemetery rules. It is important to realize that we are neither attorneys nor financial planners and the observations made here are intended to promote discussion and further exploration.

City of Franklin Municipal Ordinances

There is only one municipal ordinance that refers to burials or burial grounds. Section 20-302 requires the Franklin Building and Neighborhood Services Department Director to maintain a list of "burial grounds and human remains, located within the City of Franklin." Section 20-303 allows the Director to condition the issuance of building permits on not disturbing human remains or burial sites. Presumably this would include both City and Rest Haven cemeteries. Otherwise, the municipal code provides no specific protections to any cemetery within the City.

There are, however, other broad ordinances which are applicable to the cemetery. For example, Section 8-121 makes it a violation to be in possession of unsealed alcoholic containers in public parks; Section 20-103 establishes curfews for individuals under 17 years old which would be applicable to the cemeteries; Section 10-201 makes the Williamson County regulations concerning dogs applicable to the City as well and establishes a leash law; Section 11-402 concerns disturbing the peace; Section 11-603 makes it illegal to discharge firearms in the City, including the cemeteries; and Section 11-702 would apply to damage or theft of cemetery items, as well as trespass.

The City of Franklin also has a series of zoning ordinances. Of particular applicability to City and Rest Haven cemeteries is 5.7, Protection of Historic Lands and Structures. This ordinance is designed to protect historic properties listed on the National Register of Historic Places, such as the cemeteries, from "negative visual impacts associated with new development occurring in their proximity." The requirements are applicable to activities on the cemeteries, on property adjacent to the cemeteries, and to property across the street from the cemeteries. The ordinance primarily requires buffers.

Given the existing visual and noise intrusion from activities along Hillsboro Road as well as the potential for intrusion from Bicentennial Park, this ordinance is of special concern for the long-term preservation of the cemeteries.

It is worth noting that as long ago as 2001, Franklin's historic preservation plan remarked that the historic setting of the community's cemeteries "has been compromised by adjacent development" (Mary Means and Associates 2001:34).

Tennessee also has several state laws that are applicable to cemeteries and provide additional protections. For example, 39-17-311 makes it illegal to "desecrate" a burial while 39-17-312 makes it illegal to disinter a corpse.

Although there are currently no park ordinances that deal specifically with the cemeteries, this is being remedied. The Parks Department has developed a series of regulations that will be presented to the Board of Mayor and Aldermen in the near future. These cover a broad range of critical regulations, including:

- Establishes that the cemeteries are open from sunrise to sunset;
- Requires that only established gates be used for entrance;
- Establishes further noise and conduct stipulations;
- Prohibits animals from the cemetery, except for service animals;
- Prohibits any work in the cemetery except with the Parks Department permission;
- Prohibits firearms, alcohol, and illegal drugs in the cemeteries;
- Establishes where flags may be placed and length of time they will be allowed;
- Prohibits signs and advertising;
- Prohibits grave rubbings;
- Prohibits damage to vegetation, monuments, fences, or walls, as well as their removal;
- Prohibits plantings except with the Parks Department permission;
- Prohibits climbing or walking on monuments;
- Prohibits skateboarding, vehicles, or bikes in the cemeteries;
- Prohibits use of the cemeteries as thoroughfares;
- Requires that children be accompanied by an adult; and
- Prohibits commercial use of the cemeteries.

These are well thought out and we encourage their adoption.

Recommended Additional Regulations

There are several additional regulations that we routinely suggest at all cemeteries.

It is also appropriate to notify lot owners and visitors regarding the Parks Department's flower policy. A reasonable policy, adopted by many cemeteries is, "Flowers will be removed by the staff 10 days after holidays or when the arrangements become wilted and unsightly." This appears to incorporate some subjectivity, but it is the only approach that does not require staff to document when individual graves are decorated off-season.

It is also appropriate to include a notice of who to contact, both for routine requests or information, as well as in the case of an emergency, "For additional information concerning maintenance issues, please contact the _____ at _____. In case of emergency contact _____."

Visitation

We do not have specific data on annual visitation, but during our three-day assessment we observed eight people visiting the two cemeteries. While this is relatively low visitation – perhaps only a thousand individuals a year – we suspect that number is low given the promotion that the cemeteries receive.

There are at least two brochures advertising the City's cell phone tour (Figure 17). Available in both English and Spanish, this tour includes stops that focus on not only Franklin's Civil War history, but also the City's two cemeteries (recently, the African American Toussaint L'Ouverture Cemetery was also added to the tour). Although one brochure is more dated and does not include all 15 of the tour stops, these are still excellent promotional pieces that allow visitors to focus on topics of interest to them.

Both brochures also contains a QR code for Historic Franklin's parks. This is excellent since increasingly "smart phone" users are relying on this quick connection technique.

In addition, the private company, Franklin on Foot, offers daily guided tours of the cemetery, as well as yearly reenactor tours (http://www.franklin-onfoot.com/cemeterytours.htm; see also http://www.franklinis.com/dead-men-tell-no-tales-but-their-tombstones-do). Save A Grave (http://saveagrave.net/franklin-tenn) also includes a page on Franklin's cemeteries. Wikipedia includes stub articles for both Rest Haven (http://en.wikipedia.org/wiki/Rest_Haven_Cemetery) and City Cemetery (http://en.wikipedia.org/wiki/Franklin_City_Cemetery). It would be useful for the City to expand these articles, providing additional history, locational information, and photographs.

There are a variety of additional options for promotion available to the Parks Department and we encourage the examination of work being done at Atlanta's Oakland Cemetery (http://www.oaklandcemetery.com/) and Cincinnati's Spring Grove Cemetery (http://www.springgrove.org/events/events.aspx). While both are far larger than either of Franklin's cemeteries, the range of activities should provide some additional programming options.

Figure 17. Brochures that promote City and Rest Haven cemeteries.

Budget

Cemeteries are very different from the more conventional parks that the City has typically manages. They require different mowing and trimmer equipment and procedures; they require different periodic visitation; and they require a host of maintenance activities not typically associated with other park types. As a result, we recommend that special budgetary consideration be given to the cemeteries to ensure that they are adequately funded. At the present time the cemeteries do not have a line-item budget and we recommend that they should have a protected line of funding.

As this document reveals, the cemeteries have been allowed to deteriorate and receive, at best, what may be viewed as deferred maintenance. To bring them back up to reasonable preservation standards will require a great deal of additional attention and funding.

Recommendations

- Modifications of proposed regulations include a specific flower policy for the cemeteries. Otherwise the proposed regulations are excellent and should be adopted by Board of Mayor and Aldermen as expeditiously as possible.

- The brochure QR codes are an excellent promotional tool, but should be carefully reviewed on a periodic basis.

- The City should begin integrating additional community activities at Rest Haven and City cemeteries in order to increase visitation and support. Within two or three years several activities per month should be sustainable.

- The cemeteries should receive a line-item budget allocation commensurate with their needs and the special care that they will require.

Roads and Pedestrian Issues

City Cemetery

Vehicular Access and Circulation

At least by 1916 City Cemetery had an 8-foot drive gate erected along its western side. It is unknown what entrance predated this gate. The gate today is too narrow to allow most vehicles access to any part of the cemetery. Regardless, there is only a very narrow drive extending about 30 feet into the cemetery before it can no longer be discerned and becomes blocked with monuments. Thus, if a roadway ever existed, it was likely taken over in an effort to obtain a few additional graves.

An opening has recently been created in the east wall of City Cemetery to allow access from the Bicentennial Park pavilion east of Third Avenue Extension. While presumably the entrance will be for pedestrian access, it seems to be sized for vehicles.

The cemetery is so filled that there is no appropriate vehicle circulation route and we strongly discourage even maintenance vehicles from entering the cemetery. Only small utility vehicles are capable of maneuvering in the cemetery.

Consequently, we recommend the installation of removable bollards that are locked to a concrete set pad (Figure 18). These are manufactured by a variety of companies. Critical issues include the weatherability of the metal (the best is powder coated stainless steel), the keying alike of all padlocks, and the placement of the bollards sufficiently close together to prevent the entry of automobiles.

Parking

There is no designated parking for the cemetery. Typically visitors park on the grass verge along the west side of the cemetery on

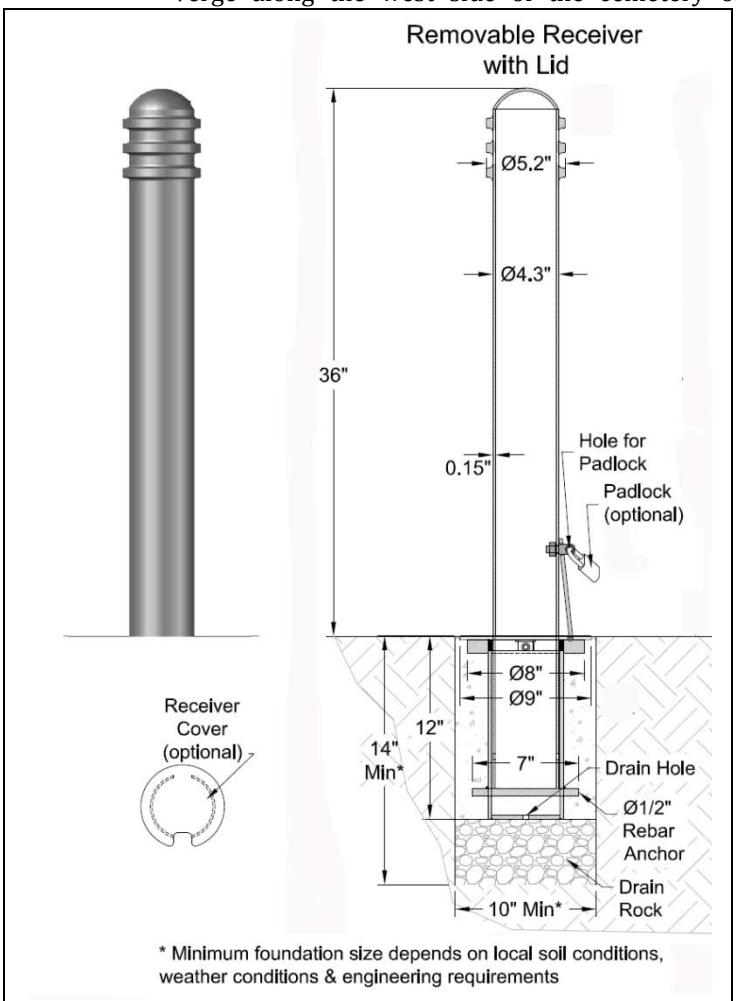

Figure 18. Example of a removable bollard (courtesy Reliance Foundry).

Fourth Avenue North (see, for example, Figure 2). There is also additional on-street parking on the west side of the Third Avenue North extension.

While this is acceptable for the current low visitation, we understand that the City, perhaps in anticipation of Bicentennial Park, wishes to create a parking lot west of Rest Haven Cemetery off Hillsboro Road. This will be further discussed in a following section.

Pedestrian Access, Pathways, and Sidewalks

Most people visiting City Cemetery come by vehicle. There is no nearby bus stop and bike routes are limited. The only sidewalks are on Hillsboro Street and along Third Avenue North extension.

Figure 19. East entrance looking west at Rest Haven. The chain should be removed and replaced with a removable bollard.

The cemetery is walled on the east, west, and south sides and fenced along the north. There are pedestrian gates at the west entrance, although they are not functional and pedestrians enter through the drive gate. Another pedestrian gate is found in the south wall, although it is also non-functional. Finally, a gate of some sort is to be erected in the east wall. All existing pedestrian gates have a free opening of 36-inches or less. This creates a very porous boundary.

Some consideration should be given to locking the south entrance gate. With no sidewalk or parking along North Margin Street, its usefulness is limited.

There are no visible formal pathways in the cemetery and examination of various photographs fails to suggest that any existed within the past 50 years. Visitation is sufficiently low that we observed no social trails (informal trails or paths created by erosion due to foot traffic from people and animals).

We did notice that currently most visitors enter through the west gate, proceeding roughly straight into the cemetery, occasionally moving off to the right or left to view a specific monument. Thus, if social trails are to be expected, they will likely appear in this northeast-southwest trajectory through the cemetery. As Bicentennial Park becomes more heavily used the City should pay special attention to the development of social trails from the east gate.

Rest Haven Cemetery

Vehicular Access and Circulation

Originally Rest Haven Cemetery had at least two drive gates. One, located on the east wall bordering Fourth Avenue North, is still present. Although inoperable, the 12-foot iron gate is in the open position and the entrance is blocked by a chain set on two metal sign posts (Figure 19).

A second drive gate was also located on the Margin Street wall, but was at some point since 2006 converted into a pedestrian gate.

Remnants of raised and crowned north-south and east-west drives are still visible in the cemetery. The western entry point still exhibits some gravel in the roadway, although this entrance point has been closed by a chain.

We recommend that the chain and metal sign posts be removed and a bollard similar to those recommended for City Cemetery be installed here. This will more positively prevent vehicular entry, but will still allow maintenance vehicles some access.

Parking

The parking situation at Rest Haven is identical to that for City Cemetery. A 15-foot grassed verge along the east wall is today used for parking (Figure 20). This is less than ideal since on this side of the road there is a ditch.

The City is anticipating the construction of a parking area on Hillsboro Street that will allow access to Rest Haven.

A major consideration for the design of this parking area is appropriate screening to prevent a visual intrusion on the cemetery.

At present, visitors are funneled into the cemetery along a partially graveled road, thereby greatly reducing the potential to produce worn pathways. It will become important to ensure that a limited entry point from this parking lot will not create a social trail and erosion where it enters the cemetery.

Figure 20. Grassed verge along the east side of Rest Haven Cemetery currently used for parking.

The creation of this lot and access to the cemetery may be further complicated by the desire to make it handicapped accessible. This issue will be discussed in a following section.

Pedestrian Access, Pathways, and Sidewalks

Like City Cemetery, Rest Haven is largely visited by individuals arriving in cars. There are no convenient bus stops and bike routes are limited. Entrance may be gained to the cemetery using gates along the north, south, and east walls, although at present it seems most visit through

Figure 21. The proposed parking area along Hillsboro Road will require visual screening to prevent intrusion into Rest Haven Cemetery.

the main, eastern entry.

The northern gate may receive more use with the opening of Bicentennial Park, although its entry is in a relatively open portion of the cemetery.

Of greater concern is the construction of the sidewalk on the east side of Hillsboro Road. Where this sidewalk turns the corner at Margin Street, it terminates, dumping users – as well as rain water – directly into Rest Haven Cemetery. This is an exceptionally poor design that will increase maintenance and serve absolutely no function since it cannot be extended. This is a poor design feature and we recommend that the sidewalk turn off Hillsboro Road into the cemetery be removed.

Universal Access

Many who visit cemeteries are elderly and therefore impairments associated with older age should particularly be taken into consideration, especially when cemeteries are amenities for tourism as in the case of Franklin's City and Rest Haven cemeteries.

Figure 22. Newly constructed Hillsboro Road sidewalk terminating in Rest Haven Cemetery.

There is concern that the entrance into Rest Haven from the proposed parking lot be accessible. This seems to be of little concern if access throughout the cemetery is not also accessible.

Of course while it is not always possible to make a natural landscape fully accessible, partial access is better than none at all. Moreover, all future modifications should explore accessibility issues in an effort to maximize access by all citizens.

The cemeteries lack steep grades and thus there are no elevation barriers to access. Nevertheless, virtually all areas have rough terrain and in a few locations the proximity of monuments can make movement difficult. In addition, we found animal burrows throughout both cemeteries, offering further obstacles to those with handicaps.

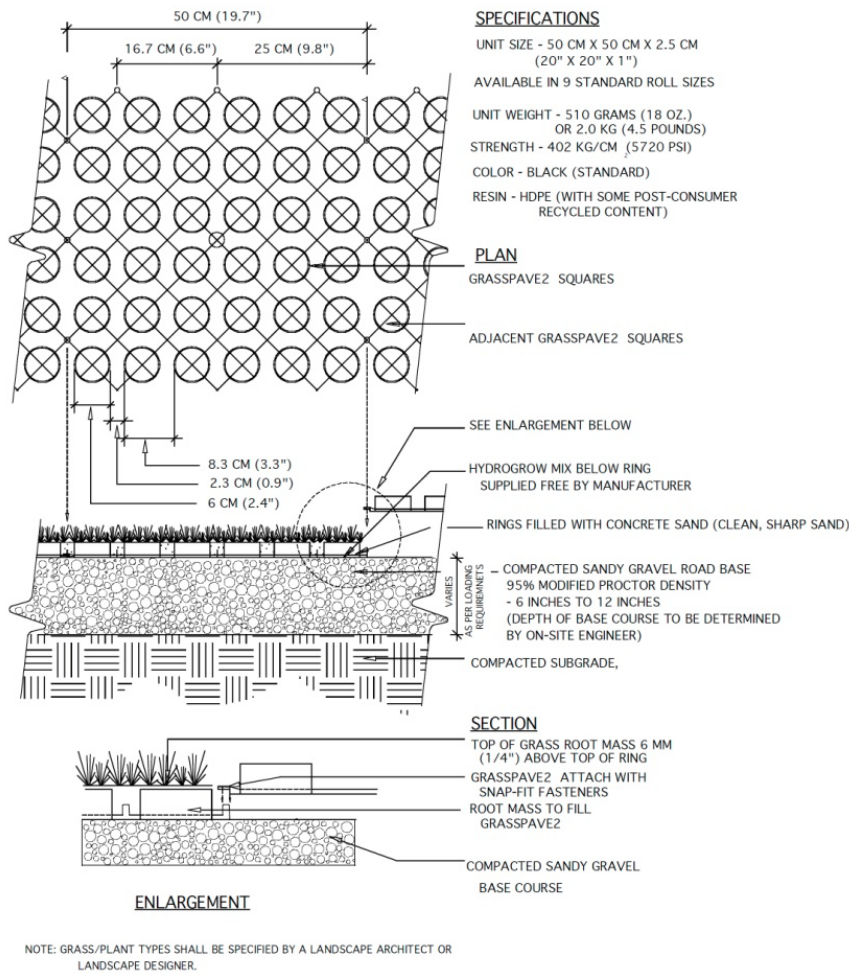

Figure 23. Specifications for one brand of grass reinforcement system.

The existing grass is a less than ideal surface for wheelchairs and others with mobility or sight disabilities. Paths in a cemetery or grassed setting should have a smooth, regular surface, with tactile warning underfoot of any hazards such as a change in level. A critical factor is to avoid simply repeating street pavement details that would clash with the cemetery setting.

Gravel should only be used if it is well compacted, with no loose stones greater than ¼". This makes it possible to push wheelchairs and reduces the possibility of tripping for those who are unsteady on their feet. Regular maintenance is required, although bound gravel or epoxy bound gravel reduces the level of maintenance. Gravel, however, is often a harsh introduction into a burial ground where pathways were never found historically or were historically grassed. Moreover, the gravel should not use stone already found in the cemetery (such as marble or granite) since such efforts may confuse the public, giving the impression that monuments were converted to paving material.

Should paving pathways eventually be required, a far better choice is to use grass tracks

underlain by a reinforcing system to provide a firm, but free draining layer on which the grass can grow. If the grass is well maintained it will not unduly hinder wheelchairs. Unattended, however, it will inhibit wheelchairs, as well as hide tripping hazards – so maintenance is critical. The pathway can be clearly identified by using a grass distinct in color and texture, providing clear visual clues to those using it.

One grass reinforcement system commonly available is the Grasspave2 porous pavement by Invisible Structures, Inc. (http://www.invisiblestructures.com/grasspave2.html). This system has the added benefit of having been approved for ADA use.

The construction of any pathways will, however, require archaeological investigations to ensure that burials or other archaeological features are not damaged.

Ideally paths should be at least 5'7" in width to accommodate wheelchair users and people with visual impairments assisted by a sighted person or guide dog. A path of this width will also allow an adult and child to walk together. The minimal suitable width is 3'11".

There are, of course, additional issues in achieving universal access, such as the use of appropriate signage and even the selection of routes in the cemeteries. While ADA compliance may not be required, the goal should be to create additions to the cemeteries that are as accessible as possible. In addition, existing obstacles to access should be removed wherever possible.

Recommendations

City Cemetery

- The City should place bollards at drive gate entrances to prevent vehicle entry.
- The southern pedestrian gate should be locked closed since there are no sidewalks or other convenient pedestrian access route along the south.
- The current on-street parking is acceptable if visitation stays at the current levels.

Rest Haven Cemetery

- The chain at the west entry should be removed and a removable bollard installed instead.
- Any parking lot on Hillsboro Road should be appropriately screened from Rest Haven Cemetery to prevent visual intrusion.
- The parking on Hillsboro Road must not be allowed to create pedestrian wear at the entry into the cemetery.
- The proposed parking on Hillsboro Road must be visually screened from the cemetery to prevent a visual intrusion.
- The sidewalk turning off Hillsboro Road on the north side of Margin Street should be removed since it currently dumps pedestrians directly into the cemetery.

Universal Access

- All future modifications at the cemeteries should be evaluated for their impact on universal access. Universal access should be a goal whenever possible.
- Future consideration should be given to establishing grass tracks underlain by a reinforcing system to achieve ADA compliance on selected pathways of appropriate widths and road access.
- Installation of pathways in the cemeteries will require archaeological investigations.

Cemetery Boundary Walls and Fences

City Cemetery

Stone Walls

City Cemetery is surrounded by a stone wall on its west, south, and east sides. It is presumed that this wall was erected in 1916 by the DAR at the same time the gate was installed, although this has not been conclusively demonstrated.

Figure 24. Evidence of hard Portland cement mortar in some areas of the walls.

Although the wall is typically called dry laid (see, for example, Tyler and Coffing (2006:4), there are many portions with large amounts of a hard Portland cement mortar (Figure 24). It is not known if this extends throughout the length of the wall or only reflects recent, inappropriate repairs.

The walls consist of stacked limestone rubble about three feet in height. The walls appear to be built without a batter, exhibiting no noticeable slope inward, and are about a foot in width. There are some noticeable differences in construction. For example, north of the west gate there are large basal stones, lacking to the south of this gate (Figure 25). All of the wall heads are retained by stone stoups (or at the west gate, with mortared stone columns). The presence of foundation stones was not determined along the east and west walls. The south wall appears to have been built on a concrete foundation, suggesting that section, at least, is relatively recent. In spite of these differences, all of the top stones are laminar angled. However, it was apparently not possible to obtain a size sufficient to span the wall width, so in most places there are double copes. These are often not interlocked, resulting in the losses noted below.

The condition of the walls is generally good; they would be given a B Condition Class – "some structural defects, but effective" and stockproof. Major defects include missing top stones, loose top stones, some bellying, and some stone loss. These conditions are shown in Figure 26.

Problems occur throughout the top cap. More significant structural problems exist primarily at the east interior wall. There are approximately 190 linear feet requiring repair (about 20% of the total wall), although most of this involves only the laminar cap and repairs should require only a few weeks. Nevertheless, these repairs should receive a high priority in order to prevent further deterioration, especially

Figure 25. Different base construction north and south of the west gate.

in the context of greater visitation with the opening of Bicentennial Park.

Repairs should be conducted by individuals with training in stone walling techniques. We understand that some members of the Parks Department have received training from the Dry Stone Conservancy (http://www.drystone.org/). If the staff cannot perform the work, we recommend that the minimum qualifications be Certified Journeyman Drystone Mason (http://www.drystone.org/masons/). A simple document that may be of assistance is the Dry Stone Walling Association's *Technical Specifications for Dry Stone Walls* (http://www.dswa.org.uk/userfiles/file/Leaflets/1-Technical-specifications-updatd-2011.pdf).

The two 1916 gate columns at the west entrance require pointing. This should be conducted by a skilled preservation mason.

A critical standard in pointing mortar joints is the National Park Service Preservation Brief 2, *Repointing Mortar Joints in Historic Masonry Buildings*, available online at http://www.nps.gov/hps/tps/briefs/brief02.htm. It is written by two of the foremost authorities in the United States.

This document makes several critical points:

- the new mortars must match the historic mortar in color, texture and tooling;
- color of new mortar is largely controlled by the sand aggregate, thus matching aggregate is critical;
- the new mortar must have greater vapor permeability and be softer (measured in compressive strength) than the masonry units;
- the new mortar must be as vapor permeable and as soft or softer (measured in compressive strength) than the historic mortar; and
- mortar is designed to be – and must be – sacrificial.

If these five rules are followed, the mortar will comply with NPS standards, be appropriate for repair work on historic structures, and most importantly "will do no harm."

Often masons use a Type S masonry cement field mixed with sand. Masonry cement is a prepackaged combination of Portland cement and plasticizers. The mix of these bagged mortar mixes is typically proprietary and is not required by ASTM standards to include hydrated lime (ground limestone is accepted). Great compressive strength is neither needed nor appropriate. The 28 day compressive strength of these mortars is 1,800 psi – far too hard for the historic bricks or even limestone. Consequently, masonry cements are not recommended for use on preservation projects.

Figure 26. City Cemetery stone wall defects. Upper row shows damage to the eastern wall, exterior (left) and interior (right). Middle left, southeast interior corner showing stone loss. Middle right, south exterior loss of capping stones. Lower left, jumbled and dumped capping stones on the south wall. Lower right, west wall damaged cap.

Figure 27. City Cemetery gates. Upper left shows the north gate at the west entrance. Upper right shows the south gate at the west entrance. Middle left shows the damaged pivot bracket on the north gate. Middle right shows the bent replacement rebar pivot rod on the south gate. Bottom left shows a welded repair on the south gate. Bottom right shows the pedestrian gate on the south wall.

An alternative for this project is the use of natural hydraulic lime (NHL) 5 which is eminently hydraulic. While not used historically, a benefit of this mortar is that it provides a quicker initial set while maintaining many of the other benefits of lime. The 28-day compressive strength of NHL 5 is about 290 psi, increasing to 1,225 psi in a year.

An alternative – and we believe better choice - to field mixes are prebagged NHL mortar and sand mixes offered by a variety of companies, including Limeworks.us (http://www.limeworks.us/ecologic_more.html), Virginia Lime Works (http://www.virginialimeworks.com/mix-go.html), and U.S. Heritage (http://usheritage.com/repointing-mortars/).

Gates

There are currently three iron gates associated with City Cemetery's boundary wall. There are two drive gates at the west entrance and one pedestrian gate at the south entrance. All of these gates are in very poor condition and require immediate intervention.

The two drive gates almost certainly date from 1916. In contrast, the south pedestrian gate is very likely nineteenth century and exhibits far finer workmanship.

In 2006 it was noted that the east entrance gate was missing and one of the stone stroups was fallen. Since that time the stone stroup is also missing.

At the west entrance are two 4-foot gates. Both are buried in soil and their hinges are no longer functional. The southern gate is missing a picket and another picket on the gate is bent and unattached from the bottom rail. It is possible that both bottom rails have suffered so much corrosion that replacement will be necessary.

At the south entrance the pedestrian gate is also buried in soil although its hinges appear to be sound. Because it is likely of wrought iron, there is less corrosion on it and it seems in overall better condition.

The bottom rails of all gates should be removed from the soil. Typically this requires the soil in this area be removed, providing positive drainage away from the ironwork and ensuring that the bottom rail is at least 2-inches above the soil. If it is not possible to establish positive drainage, we recommend that sufficient soil be removed to create a swale or drainage area that will keep the ironwork above grade.

It is likely that all three will need to be removed to a shop for repairs. These may consist of repair or replacement of the bottom rails where corrosion has made them weak or non-functional. The lost picket on the southern drive gate should be replaced. The bent picket should be straightened and reattached to the bottom rail (replacement may be needed).

The pivot brackets and the pivots will need to be repaired or replaced. The rebar is entirely too soft to provide reasonable support and should be replaced with a stronger iron rod. The pivots will need to be reset in the stone columns.

Welding repairs are acceptable where little or no expansion or contraction of the iron is anticipated. Where there were originally slip joints, however, welding is inappropriate since it will create stresses that can cause additional damage. For these areas it is necessary to infill the fabric and recreate slip joints that allow movement.

Where welding is appropriate, it must be of very high quality. Appropriate welding processes may include gas tungsten arc welding (GTAW) and shielded metal arc welding (SMAW). Since these gates represent either wrought iron or mild steel, welding should pose no real problems. Often NiRod Ni-99, silicon-bronze wire, or stainless steel wire will be used. These are selected for their compatibility and ductility.

All welds must be continuous and ground smooth.

At the completion of this work the fences

should be painted. Since the drive gates exhibit remnant paint they require different treatment than the pedestrian gate.

We do not recommend anything more than brushing of the gates to remove loose corrosion and flaking paint. Open joints and other areas where water can penetrate through capillary action should be carefully caulked with Sikaflex 1a, an elastomeric caulk that is often used in fence repair. Under no circumstance should a silicon caulk be used.

Figure 28. South end of the east gate showing the missing granite stroup.

The gates and associated mounting hardware should then receive one coat of an alkyd primer, such as Rust Oleum Professional High Performance Metal Primer 7769. After this has cured it should be followed by two top coats of flat black alkyd paint, such as Rust Oleum Professional High Performance Flat Black 7776402.

In contrast, the pedestrian gate exhibits no remaining paint. This is a perfect situation for light brushing to remove loose corrosion followed by the application of Rust-Oleum Rust Reformer®. This product has been tested by the Canadian Conservation Institute, including exposure to very harsh salt spray and was one of their top three best performers (it is, today, the only formulation still available). Rust Reformer® is a conversion process that stabilizes the corrosion products and serves as a primer. This product cures to a blue-black color.

It should be top coated with Rust-Oleum High Performance Protective Enamel® in flat white followed by a final top coat of flat black 24 hours later. This is a quality assurance process since any areas missed by the flat white will immediately be identified by the undercoat of black Rust Reformer®. Similarly any areas missed by the application of final top coat of flat black will immediately be recognized by the underlying white paint.

Paint application should be by brush, producing initial dry coat of 1-2 mils (the wet build-up is typically twice this).

It is also important to emphasize that in the future paint must be maintained and not allowed to deteriorate to the point currently observed. In addition, the quality of past painting was unacceptable, with much paint being applied to the stone columns. The City must ensure higher quality work.

As previously suggested, the south entrance gate should be locked to eliminate use of this entrance. Locking will also help protect this gate, which likely has considerable antiquity and deserves additional protection to prevent theft.

Proposed New Gate

We understand that the eastern drive gate is to be replaced. We do not feel this is an especially high priority for several reasons. First, none of the gates will be closed on any regular basis and even if they were, the relatively low wall forms at best a permeable boundary. Second, there do not appear to be any photographs showing the original gate, so any replacement will

Figure 29. Chain link fence along the north property line. Upper left, vines and other vegetation should be removed from the fence. Limbs from adjoining property should be removed to the property line. Upper right shows a tree grown into the fence. Middle left shows a tree fallen on the fence. Middle right shows a second tree growing into the fence which must also be removed. Lower left shows a damaged and bent top rail. Lower right shows a section of fence that is totally down.

likely lack historic authenticity. Finally, there are many other very high priority needs at the cemetery where funding could be better spent.

Assuming, however, that a new gate is already "in the works," we will offer several recommendations.

The missing stone stroup at the south end of the entrance must be replaced. The replacement may be modeled after the remaining stroup at this entrance. The gate should be modeled after the pedestrian gate at the south entrance which appears to have some age and is likely a good candidate for the now missing east gate.

Fence

Along the north boundary there is a residential grade chain link fence spanning the roughly 400 linear feet. This fence is heavily overgrown and approximately 160 linear feet (about 40%) requires repair or in many cases replacement.

We recommend that all vegetation be removed from the fence. This includes vines and downed timber. We also recommend that all trees under 4-inch dbh be removed from within 10 feet of the fence. This will minimize future damage from downed limbs.

Where vegetation exists on adjacent private property and the owner will not allow removal, all limbs overhanging the cemetery should be removed to the property line.

In areas where the top rail or line posts have been damaged, they must be replaced and the fence restretched. If the damage is too severe, the sections should be entirely replaced with new fabric being woven into the existing fence.

In the future, the City should monthly inspect this fence line to ensure that it is in good condition. The use of herbicides should be limited and instead nylon trimmers should reduce vegetation on either side of the fence periodically.

Rest Haven Cemetery

Stone Walls

Rest Haven Cemetery is surrounded by a stone wall on its south, east, and north sides. This wall continued south from the northwest corner for about 120 feet before disappearing.

Historic accounts are unclear, suggesting that originally the cemetery was walled on its west, south, and north sides, with a board fence along its eastern side.

By 2006, the southern wall extended only about 200 feet to what was a southern drive gate. It appears that this wall was built or rebuilt in 2007 and the drive gate was converted into a pedestrian gate. What became of the removed iron work is not known.

Unlike the City Cemetery wall, the Rest Haven wall does appear to be dry laid throughout its length except at the southeast corner where it appears the corner has been extensively repaired using a hard Portland cement mortar. Given the proximity to the roads, this may reflect an earlier traffic accident repair.

The walls consist of stacked limestone rubble about three feet in height. The walls appear to be built without a batter, exhibiting no noticeable slope inward in most places, and are about 2 feet in width.

Wall heads at the south and north gates are retained by stone stoups. At the east drive gate there are mortared stone columns. There are no wall heads at the terminus points along the northwest wall or the western end of the southern wall. Along the south, adjacent to Margin Street, the wall appears to have been built on a concrete foundation. As with City Cemetery, it appears that much of this is recent, having been built in 2007.

All of the top stones are laminar angled. In general, a size sufficient to span the wall width was used. Only in a few areas are there double copes.

Figure 30. Condition of the stone wall at Rest Haven Cemetery. Upper left shows a slump on the east exterior wall. Upper right shows stone loss and incipient slump on the east wall. Middle left, stone loss with stones partially buried in the soil beyond the wall. Middle right shows more extensive area of wall collapse. Lower left shows total collapse of the wall. Lower right shows bowing of the wall.

Figure 31. Condition of the stone wall at Rest Haven Cemetery. Upper left shows an overview of damage along the east wall. Upper right shows very poor construction techniques in one area. Middle left shows the terminus of the southern wall without a stroup. Middle right shows vegetation allowed to overtake the wall. Lower left shows the southeast corner with Portland cement repair. Lower right, missing top stones, northeast corner.

Figure 32. Wall and column damage at the east entrance. Upper row shows extensive loss of mortar at the entrance gate and pedestrian gate columns. Bottom left photo shows the entrance with damage to the north and south inset flank walls. Bottom right shows a closer view of the damage to the north flank wall.

The condition of the walls exhibits much greater variability than the walls at City Cemetery. Many of the walls, especially the southern portion, have an A Condition Class, being in excellent condition with nearly all top stones in place, the sides smooth and straight. Other sections exhibit lower condition classes, exhibiting fallen stones, bellying, slumping, and in one area extensive plant growth. Problems occur throughout the top cap. One section along the east exhibits a large gap where the wall has collapsed and has an E Condition Class. These conditions are shown in Figures 30 and 31.

We estimate that about 300 feet of top stones require resetting. More significantly, about 270 linear feet of the walls require minor to major reconstruction. In many places it will be necessary to completely remove the wall and rebuild it. This represents about 40% of the total extant wall – clearly demonstrating how the Rest Haven wall has been allowed to significantly deteriorate on the City's watch. These repairs should receive a high priority in order to prevent further deterioration.

Not included in these estimates is the area of the drive and pedestrian gates at the east entrance. The stone walls here are in near complete failure and the columns exhibit much

loss of mortar – far worse than seen at City Cemetery.

Repairs of the dry laid stone walls should be conducted by individuals with training in stone walling techniques. We understand that some members of the Parks Department have received training from the Dry Stone Conservancy (http://www. drystone.org/). If the staff cannot perform the work, we recommend that the minimum qualifications be Certified Journeyman Drystone Mason (http://www.drystone.org /masons/). A simple document that may be of assistance is the Dry Stone Walling Association's *Technical Specifications for Dry Stone Walls* (http://www.dswa.org.uk/userfiles/file/Leaflets/ 1-Technical-specifications-updatd-2011.pdf).

Our previous discussions regarding the pointing of the columns at City Cemetery will be briefly repeated here for the convenience of readers. It is essential that the Parks Department be familiar with the National Park Service Preservation Brief 2, *Repointing Mortar Joints in Historic Masonry Buildings*, available online at http://www.nps.gov/hps/tps/briefs/brief02.htm. It is written by two of the foremost authorities in the United States.

This document makes several critical points:

- the new mortars must match the historic mortar in color, texture and tooling;
- color of new mortar is largely controlled by the sand aggregate, thus matching aggregate is critical;
- the new mortar must have greater vapor permeability and be softer (measured in compressive strength) than the masonry units;
- the new mortar must be as vapor permeable and as soft or softer (measured in compressive strength) than the historic mortar; and
- mortar is designed to be – and must be – sacrificial.

If these five rules are followed, the mortar will comply with NPS standards, be appropriate for repair work on historic structures, and most importantly "will do no harm."

Often masons use a Type S masonry cement field mixed with sand. Masonry cement is a prepackaged combination of Portland cement and plasticizers. The mix of these bagged mortar mixes is typically proprietary and is not required by ASTM standards to include hydrated lime (ground limestone is accepted). Great compressive strength is neither needed nor appropriate. The 28 day compressive strength of these mortars is 1,800 psi – far too hard for the historic bricks or even limestone. Consequently, masonry cements are not recommended for use on preservation projects.

An alternative for this project is the use of natural hydraulic lime (NHL) 5 which is eminently hydraulic. While not used historically, a benefit of this mortar is that it provides a quicker initial set while maintaining many of the other benefits of lime. The 28-day compressive strength of NHL 5 is about 290 psi, increasing to 1,225 psi in a year.

While field mixes can be prepared, we believe that a better choice is the use of prebagged NHL mortar and sand mixes offered by a variety of companies, including Limeworks.us (http://www.limeworks .us/ecologic more.html), Virginia Lime Works (http://www.virginia limeworks.com/mix-go.html), and U.S. Heritage (http://usheritage.com /repointing-mortars/).

The columns reveal that the original jointing was a protruded bead. Good preservation practice mandates that this tooling be replicated.

For unknown reasons, the architect designing the Bicentennial Park landscape along Fourth Avenue North extension at the north end of Rest Haven Cemetery located a variety of sprinklers in such a manner that the limestone walls are becoming saturated every time the system is turned on (Figure 33). This will promote the premature deterioration of these walls, making their long-term maintenance much more

Figure 33. Sprinklers wetting the north cemetery wall should be removed or adjusted to ensure the wall remains dry.

difficult.

It is critical that these sprinklers be adjusted to prevent wetting the limestone walls.

In addition, a sprinkler head was located almost in the middle of the north cemetery entrance. This head will suffer constant damage by pedestrian activity and should be relocated.

Gates

There are currently four iron gates associated with Rest Haven Cemetery's boundary wall. There is one drive gate at the east entrance coupled with two pedestrian gates at the same location. All of these gates are in poor – and inoperable – condition. There is a fourth gate at the south entrance.

The drive gate is about 12 feet in length and constructed from mild steel. It likely dates from the very late nineteenth or early twentieth century. While no name plate is present, the style is very similar to gates manufactured by Stewart Iron Works during this period. The flanking pedestrian gates match the design of the drive gate.

The bottom rail of the drive gate is buried in the soil. Both the right and left frames are bent, as are multiple pickets. Connections to the stone column have failed and one is missing.

The bottom rail of the north pedestrian gate is buried in soil and six finials are missing. The riveted connections between the gate frame and the hinge in the upper corner have failed. The hinges, however, appear to be sound. The closing/locking mechanism is missing.

The bottom rail of the south pedestrian gate is also buried, making the gate inoperable.

Figure 34. Gate problems. Upper left is the east drive gate showing damage. Upper right is the upper drive gate hinge showing damage to the stone column. Middle left shows the lower drive gate hinge. Middle right shows the northern pedestrian gate. Lower left shows the southern pedestrian gate. Lower right shows the small southern pedestrian gate with the missing section to the west.

Four finials are missing and two pickets are bent. The hinges appear sound, although there is no closing/locking mechanism present.

The southern pedestrian gate is found in a 9-foot entrance; the other gate section identified in 2006 is no longer present today. This ironwork is heavy, consisting of both wrought and cast elements. It is far better constructed than the eastern gates and likely dates from the nineteenth century.

Several cast sections are broken and missing (although they may still be present, but buried in the soil). While the bottom of the southern gate is also buried in the soil, the hinges appear sound. There are multiple open areas between the cast design and the gate frame that allow water entry.

The bottom rails of all gates should be removed from the soil. Typically this requires the soil in this area be removed, providing positive drainage away from the ironwork and ensuring that the bottom rail is at least 2-inches above the soil. If it is not possible to establish positive drainage, we recommend that sufficient soil be removed to create a swale or drainage area that will keep the ironwork above grade.

It is likely that all four will need to be removed to a shop for repairs. These may consist of repair or replacement of the bottom rails where corrosion has made them weak or non-functional. Bent pickets should be straightened. Finials need not be replicated, although it may be possible to find readily available replacements.

The drive gate, in particular, will require extensive hinge repairs at the stone column in order for the gate to be hung and for it to be functional. The column should be pointed first and allowed several months to cure to ensure it is structurally able to support the gate.

Welding repairs are acceptable where little or no expansion or contraction of the iron is anticipated. Where there were originally slip joints, however, welding is inappropriate since it will create stresses that can cause additional damage. For these areas it is necessary to infill the fabric and recreate slip joints that allow movement.

Where welding is appropriate, it must be of very high quality. Appropriate welding processes may include gas tungsten arc welding (GTAW) and shielded metal arc welding (SMAW). Since these gates represent either wrought iron or mild steel, welding should pose no real problems. Often NiRod Ni-99, silicon-bronze wire, or stainless steel wire will be used. These are selected for their compatibility and ductility.

All welds must be continuous and ground smooth.

At the completion of this work the gates should be painted. We do not recommend anything more than brushing of the gates to remove loose corrosion and flaking paint. Open joints and other areas where water can penetrate through capillary action should be carefully caulked with Sikaflex 1a, an elastomeric caulk that is often used in fence repair. Under no circumstance should a silicon caulk be used.

The gates and associated mounting hardware should then receive one coat of an alkyd primer, such as Rust Oleum Professional High Performance Metal Primer 7769. After this has cured it should be followed by two top coats of flat black alkyd paint, such as Rust Oleum Professional High Performance Flat Black 7776402.

Paint application should be by brush, producing initial dry coat of 1-2 mils (the wet build-up is typically twice this).

It is also important to emphasize that in the future paint must be maintained and not allowed to deteriorate to the point currently observed. In addition, the quality of past painting was unacceptable, with much paint being applied to the stone columns. The City must ensure higher quality work.

Western Boundary

At the present time there is no fence along the cemetery's western boundary. This exposes the cemetery to cut-through pedestrian traffic and reduces security. We believe that this boundary should be secured in some manner.

While a stone wall could certainly be constructed, matching the small portion already present, this would be a very expensive option given that approximately 600 linear feet would be required. Since the lots along Hillsboro are about 5 feet above the grade of the cemetery, a 3-foot wall would offer little in the way of an effective barrier. In addition, given the development along Hillsboro, it will be necessary to plant screening vegetation, dramatically reducing the visibility of whatever boundary is established. Construction of a stone wall seems, therefore, an unnecessary expenditure.

Consequently, we recommend that approximately 600 linear feet of chain link be erected along this western cemetery boundary. The City should use higher security fencing than is typically provided by residential or even commercial fencing. It is, however, necessary to balance security with the concern that the cemetery not appear like a fortress. The cemetery is a public space and must remain inviting.

- Height – The height should be evaluated against the ease of breaching. Since the fill section along Hillsboro Street is about 3 feet above the cemetery grade, the fence must be a minimum of 6 feet in height and preferably 8 feet.

- Top Rail – Fencing should eliminate the top rail, installing instead a 7-gauge coil spring wire. This will make the fence more difficult to climb.

- Bottom Rail – Fencing should require a bottom rail that is secured in the center of the two line posts using a 3/8" eye hook anchored into a concrete footing. This eliminates the possibility of forcing the mesh up to crawl under the fence.

- Chain Link Fabric – The material should be PVC color coated per ASTM F668 Class 1 minimum. The coating will significantly reduce maintenance and improve the life span of the fencing. Mesh should be 1" and 11 gauge. Most chain link is 2"; the reduced size makes it much more difficult to climb. Twisted selvage should be specified for the top and bottom selvage if permitted by local code; this will enhance security.

- Bolts – All bolt threads should be peened to eliminate the removal of bolt nuts.

- Fittings and framework – Higher security fences generally require heavier brace and tension bands, as well as wire ties. Likewise, the framework is typically heavier. Line posts should not be spaced more than 8' apart.

If the City intends to create a parking lot for the cemetery as we have been told, then a 4-foot wide pedestrian gate should be included in the design. This gate should be lockable.

The benefits of this fence extend beyond increased security. This grade fence, with PVC coating, will have a much longer lifespan and will require much less maintenance.

While it may seem unattractive, in a following section we will make recommendations regarding screening that will reduce the visibility of the fence from within the cemetery.

Recommendations

City Cemetery

- About 190 linear feet of the stone wall requires repair. Most of this involves resetting of the angled laminar top stones, although several wall sections do require rebuilding.

- The southern pedestrian gate should be locked closed since there are no sidewalks or other convenient pedestrian access route along the south.

- The 1916 gate columns require pointing using a softer mortar than the existing Portland cement mortar.

- The west drive gates should be operable. This will involve removing them from the soil, repairing the bottom rails and pickets, and resetting the gates properly, replacing the lost pivots and repairing pivot arms.

- The south pedestrian gate should be removed from the soil and further evaluated for needed repairs.

- All gates should be painted, using either an appropriate primer and top coat as specified if there is remnant paint, or using Rust Oleum Rust Reformer and top coats where only bare metal is present.

- We do not recommend the replacement of the east drive gate, although the missing stroup should be reset.

- If the eastern drive gate must be replaced, we recommend that it be modeled after the southern pedestrian gate, which we believe dates to at least the nineteenth century.

- All of the vegetation under 4-inches dbh along the northern chain link fence should be removed, including trees that have grown into the fence.

- A 10 foot clear zone should be establish on either side of this fence and overhanging branches should be removed to the fence line.

- About 160 linear feet of the chain link fence requires repair or replacement.

- The repaired fence line should be inspected by the City on a yearly basis to ensure its maintenance.

Rest Haven Cemetery

- About 570 linear feet of stone wall at Rest Haven requires repair. About 300 linear feet will involve primarily the resetting of the angled laminar top stones. An additional 270 linear feet, however, will involve extensive rebuilding of the wall.

- The east entrance gate columns all require extensive pointing using a 1:2.5 mix of gray NHL 5 and sand.

- The east entrance flanker walls require rebuilding.

- Sprinklers wetting the north wall must be relocated and/or adjusted to prevent the limestone walls from being wetted. The sprinkler head in the middle of the north entrance must also be moved.

- All gates should be made operable. This will involve removing them from the soil, repairing the bottom rails, straightening pickets, and resetting the gates properly, replacing or repairing hinges and column mounts.

- All gates should be painted, using an appropriate primer and top coat as specified.

- We recommend the installation of about 600 feet of higher security industrial chain link as specified along the western cemetery boundary.

Cemetery Security

Franklin's City and Rest Haven cemeteries, like virtually all cemeteries, have over time been plagued by vandalism. Unfortunately, the level of attention devoted to the cemeteries in the past, coupled with a lack of detailed historical research, makes it difficult to determine the level of vandalism or when it has occurred. The Parks Department is, however, aware that during the summer of 2013 a 6x6 inch cornerstone was removed from the cemetery. Moreover, during this investigation we were able to identify other instances of probable vandalism or theft.

We are told that the City of Franklin's insurance of city property would cover damage in the cemetery. Of course, it would be necessary to demonstrate that the damage was not pre-existing, all insurance has deductibles, and insurance rates can rise with the number of losses reported. Nevertheless, the City is fortunate to have this coverage in case of a major incident at either City or Rest Haven cemeteries.

Vandalism

The Parks Department does not have a formalized mechanism for identifying or reporting vandalism specific to the cemetery setting. Nor is maintenance at a sufficient level to preclude the likelihood of vandalism (there is a correlation between maintenance and vandalism).

At the present time there is no systematic inspection process. It seems unlikely that the maintenance staff would recognize vandalism for what it is, or have any idea when it occurred. It will be difficult to ascertain the level of damage the cemeteries suffer without some method of periodic inspection.

There are relatively few studies of the causes of vandalism. Those that exist present a broad range of possible reasons, including poverty, unemployment, disintegration of family life, and availability of drugs and alcohol. Other studies include problems inherent in single family homes and parents that fail to guide their children in social and moral issues. Even the judicial system itself is thought to contribute to the problem by failing to deal more harshly with offenders (see, for example, De Wet 2004).

Unfortunately, cemetery specific vandalism has not been studied and we must rely on studies largely focused on school vandalism to understand the phenomenon (although we have no assurance that the two can be reasonably related). Most school vandals are typically young (junior high school), male, and act in small groups. Participating in vandalism often helps a youth to maintain or enhance his or her status among peers. They have typically done poorly academically and have little or no understanding of how their behavior affects others. They are not, however, any more likely to be emotionally disturbed than their peers who do not commit vandalism. Those who commit vandalism are not likely to be judged harshly by their peers. Youth who lack fulltime parental supervision during after-school hours are more likely to commit vandalism.

To this we can add that our experience with vandalism suggests a very strong correlation between the vandalism and considerable alcohol consumption. Moreover, we find that vandals extend in age well into the 20s.

Physical measures to reduce vandalism – such as installing fences and erecting lights – have great appeal. Such projects are easy to understand and physical measures generally have only a one-time outlay of funds. Nevertheless, most authorities agree that vandalism is the combined

Figure 35. Examples of probable vandalism. The top photo shows a pinned stone with a level base in City Cemetery. It is likely this was intentionally pushed over. The bottom photo, from Rest Haven Cemetery shows a toppled obelisk. While the base was tilted, it was not yet at a point that the obelisk would have fallen without assistance.

result of the offenders' characteristics and those of the physical and social environment in which the behavior occurs. If our response is to be effective we must focus on both the person and the environment. Programs that target only one of these variables – such as physical measures – will not be successful in the long-term. Moreover, they run the risk of making the cemetery appear fortress-like.

Unfortunately, measures that examine offender behavior, administrative policies, or community involvement seem more complex and difficult to implement. Group consensus for more complex programs may be more difficult, largely because the possible responses can be overwhelming. To simplify, we will focus on four main tactics: those that impact the physical environment, those that impact the offender, those that focus on administrative practices, and those that enlist the community's help. We encourage the implementation of a balanced approach involving all four tactics and believe that the success of programs to reduce cemetery vandalism rely on a broad-based initiative.

It is worth noting that while we see probable evidence of vandalism at the cemeteries, we cannot determine its prevalence or whether it is increasing or decreasing.

Changes to the Physical Environment

Control access to deter unauthorized entry

The boundaries for the cemeteries must be less permeable. In practice this means immediate effective repair of the existing City Cemetery fencing along the north border and the erection of chain link fencing along the west boundary of Rest Haven Cemetery. These measures can reduce the opportunities for illegal or inappropriate entry and can also delay or make the intruders' efforts to get away more difficult.

Post Regulatory Signage

Access-control signs are an important part of "rule setting" in that they establish the types of activities prohibited in the cemeteries. As discussed in the section entitled “Other Maintenance Issues,” the cemeteries require regulatory signage. These signs need to be installed at all entrance gates.

Lighting

Lighting is sometimes seen as reducing vandalism. There is no consensus on whether well-lit areas or "dark" locations are superior in terms of crime prevention. Cemeteries were not lighted historically. Thus, the introduction of lighting detracts from the historical integrity of the properties, changing the historic fabric. Another issue to be considered 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 those in Franklin.

There are currently several Cobra Head luminaires in the immediate vicinity of the cemeteries. They are not, however, sufficiently common that they likely provide any significant illumination of either cemetery.

Regardless, we do not recommend that any additional lighting be installed.

Repair damage quickly and improve the appearance of the Cemetery

Clean, well-maintained cemeteries free of debris or garbage, free of evidence of past vandalism, and with attractively landscaped grounds are less at risk for vandalism. Consistent maintenance may serve as an "occupation proxy," giving the appearance that the cemetery is under steady surveillance by those concerned about keeping it safe. Conversely, cemeteries with much trash, evidence of damage, or poorly maintained grounds give the appearance of abandonment; if no one in society cares for the property, why should the prospective vandal? Simply put, the appearance of abandonment breeds additional damage and vandalism. Thus, it is critical that the level of maintenance at City and Rest Haven cemeteries be immediately improved.

Ensure Ready Access to the Property by Law Enforcement

None of the cemetery gates are locked and we do not recommend that they be routinely closed or locked except for the south pedestrian gate at City Cemetery – the boundaries are simply too porous for this action to be meaningful. In addition, it is of benefit if police can quickly enter the cemeteries, even if on foot.

Offender-Focused Responses

Increase the Frequency of Police Patrols

Increasing the frequency with which police patrol the periphery of the cemeteries increases the likelihood that potential vandals will be seen. Even though there are no roads through the cemeteries that would allow police to readily access the grounds, the act of raking their spot light through the cemeteries will give the appearance of visibility.

Patrols should be especially vigilant during holidays such as Halloween and once the Bicentennial Park is open to the public.

Use of Electronic, CCTV, or Photographic Monitoring

An option for hardening cemetery targets is the use of video and photographic imaging technologies. At the high end are systems such as VistaScape – an automated wide-area surveillance system that detects, tracks, and classifies objects in real time on a computer screen. If an object violates a policy set by the user, the software streams live video of the alarm event to the display and can also send wireless alerts to law enforcement personnel. Although an ideal solution, the cost makes such system beyond the reach of most cemeteries.

An alternative, however, is the Flashcam by Q-Star Technology (http://www.qstartech.com). This self-contained digital system is motion activated; a photograph is taken (a flash unit allows night photographs at 100 feet), and a customized recorded announcement is played. Units are solar powered, eliminating the need for electrical connections. Photographs are high resolution and time/date stamped. Units can be

downloaded wirelessly. Although not inexpensive, they are among the most affordable solutions for cemeteries facing on-going vandalism and theft problems.

Though the initial financial outlay may be significant, over the long term, these surveillance systems may be less expensive than security patrols. Nevertheless, we would only encourage this outlay if the cemeteries experiences significant problems in the future.

Provide Caretakers on the Cemetery Grounds

The continuous presence of a caretaker in a cemetery can deter potential intruders. At one time this was achieved by resident superintendents who lived on cemetery properties in exchanged for rent free housing. While this is not possible at in Franklin, several other options are possible.

Volunteers should be given readily identifiable t-shirts (distinctive color and logo) to wear when working in the cemeteries and this should be publicized. Volunteers should be scheduled to conduct periodic inspections of the cemeteries during the week and on weekends, throughout the year. Like police patrols, these visits should be unscheduled and occur at different times and on different days. These volunteers should not confront vandals, but should be eyes and ears, providing a presence in the cemeteries and immediately reporting any suspicious activities.

Hold Offenders Accountable

Very few perpetrators of cemetery vandalism are identified and apprehended, and even fewer are prosecuted. Courts are generally lenient with offenders, and in most cases, the damage from an individual incident is seen as minor and does not appear to warrant harsh penalties. However, creative and well-publicized interventions to hold offenders accountable can have both a specific and a general deterrence effect. Restitution programs include a set of administrative and legal procedures to get money from offenders to pay for repair or replacement of damaged property. Publicizing the results of these efforts is important to maintain their deterrent effect.

The City should ensure that police investigate vandalism and work to secure an arrest. If an arrest is made, representatives of the cemeteries should be present in court, testify concerning the impact – and cost – of the damage, and ask for the maximum punishment possible. If no restitution is required by the court, the City should consider civil court action to recover costs associated with professional repair of the damage.

Management Practices

Maintain an Inventory of Cemetery Stones and Their Condition

Vandalism often goes unreported because cemetery caregivers do not know what is present in the cemetery or its condition. Thus, vandalism can be overlooked as pre-existing damage. This makes a complete stone-by-stone assessment critical for near-term inventory purposes.

Volunteers must also become familiar with the stones in the cemeteries and their condition. While it is obviously impossible to know each stone, volunteers may be assigned specific areas to become familiar with the stones and the condition of the stones in that one area. Inspections could then be conducted monthly.

Community-Focused Responses

Provide Rewards for Information Concerning Vandalism

Offender-focused responses require that vandals be identified and apprehended. Police investigations of vandalism incidents can be enhanced by high-quality information provided by community residents and even students from local schools. As seen with traditional "Crime Stoppers" programs, setting up telephone or internet-based tip-lines, offering rewards for information, and

guaranteeing anonymity encourages people to come forward with specific information. The most effective programs actively involve volunteers in collecting and synthesizing information for police, and in determining payout amounts in the event of apprehension.

Create "Cemetery Watch" Programs

Similar to "Neighborhood Watch" efforts, community residents can conduct citizen patrols of cemetery property during evenings and weekends. Membership and regular participation in voluntary patrols increase when some form of prestige is offered to volunteers. Effective practices include:

- patrolling regularly, but at unpredictable times;
- ensuring volunteers have cell phones for prompt communication with police or other emergency services;
- engaging in passive surveillance only, and not interacting with potential vandals or intruders in any way; and
- publicizing activities and outcomes through school-based and local media outlets.

As an adjunct to this, residents in adjacent buildings should be especially encouraged to be attentive to problems in the cemeteries. Unusual noise, lights, or activities should be sufficient to have neighbors call the police to report their concerns. The City should seek to encourage the active participation of residents surrounding the Cemetery, especially the residences along North Margin Street. Meetings should be held, preferably in the evening and preferably on the premises of the residents, to allow the City to enlist the support of these residents.

In response to a specific problem or rash of incidents, Watch programs can produce short-term reductions in vandalism. However, these programs are difficult to sustain, so the City will likely need to periodically "rejuvenate" the program by holding new meetings and bringing in new participants.

The City should also consider developing similar programs using volunteers to assist in collecting trash, cleaning stones, painting fences, or other activities. Boy and Girl Scout troops should also be contacted. Involving students in the care of cemeteries, and engaging them in ongoing, active projects will help establish a strong bond in the community.

Vandalism Records

We recommend that the City develop a form designed for the reporting of cemetery-specific vandalism (Figure 36). This form should include information such as what was damaged, with specific information concerning each stone, including the name and lot/plot; how the stone was 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, including 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, with a copy of the report attached; and the outcome of the police investigation.

Theft

There are no specific records of theft other than the one item mentioned in the introduction to these discussions. Nevertheless, we suspect that theft has been a long-standing issue, as evidenced by lost gates and fencing.

For example, three of the 11 gates in Rest Haven Cemetery are missing (27%) and an additional two gates are no longer attached and could be easily stolen (representing an additional 18%). The single remaining fenced plot in City Cemetery is missing its gate. Three boundary

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CEMETERY VANDALISM/DAMAGE REPORT FORM

Cemetery: **Number of Stones/Objects Involved:** **Are Human Remains Involved:** ☐ yes ☐ no

Grave #: **Section #:** **Lot #:**

Date/Time Damage was First Observed: am/pm **Name of Observer:**

Date Last Observed Undamaged: am/pm **Name of Observer:**

Potential Witnesses:

Nature of Damage (attach photographs of damage):

Date Reported to Police: **Investigating Officer:**

Police Incident No: **(Attach a legible copy of police report to this form)**

Estimate of Damage (attach justification, conservation treatment proposals): **$**

Owners of Monuments Identified: ☐ yes ☐ no **Owners Will Repair:** ☐ yes ☐ no ☐ not certain

Follow Up with Police:

Repairs Undertaken by Cemetery (attach conservation treatment reports):

Total Cost of Repairs: $ **Insurance Eligible:** ☐ yes ☐ no **Date Claim Submitted:**
Date Claim Approved/Paid: **Amount of Claim Payment: $**

Internal Evaluation for Future Prevention:

Form Completed By: **Date(s):**

Figure 36. Example of a vandalism report recommended by Chicora.

gates – one at City Cemetery and two at Rest Haven Cemetery – have been stolen.

Many of the numerous gates in the cemeteries are easy to lift off their connectors and steal. These gates are valued in antique stores and are almost impossible to recover once stolen.

Figure 37. Example of a gate protected with stainless steel cabling that has been painted to blend with the fence.

It is a simple maintenance step to use woven stainless steel wire to secure gates to their hinge posts. This allows the gates to open and close, but makes them considerably more difficult to lift off their hinges and steal. The cost to protect gates is less than $20 each and the time involved is about 15 minutes. This is something that the Parks Department staff or volunteers could easily accomplish. The NPS article, http://crm.cr.nps.gov/archive/25-02/25-2-15.pdf provides additional information.

Dealing with the Homeless

It appears that there is a very low incidence of homelessness in the Franklin area. Nevertheless, we recommend that the City evaluate the need for a defined policy.

All laws with respect to public behavior should be enforced in the cemeteries by law enforcement. Should any shopping carts, bedding, or other personal belongings be found secreted away in the cemeteries, they should be removed from the property promptly. The landscape must be maintained to prevent hiding places and to ensure clear lines of sight. The Cemetery must be kept free of litter and debris.

Other Issues

During our assessment we observed pre-adolescents cutting through Rest Haven Cemetery from Fourth Avenue North to Hillsboro Street (Figure 38). This is made easy and convenient by the collapsed stone wall and the absence of any barrier along Hillsboro. It also demonstrates the need for the stone wall to receive a high priority for repair and for a security fence to be constructed along Hillsboro. Unaddressed this behavior will create social pathways or trails and will also promote vandalism.

Recommendations

- While evidence of vandalism exists in both cemeteries, it is difficult to determine the extent of the problem. The City should, however, review options to combat vandalism and determine which could be implemented to help harden the cemeteries against vandalism.

- The boundary fence should be cleared of

Figure 38. Pre-adolescents cutting through Rest Haven Cemetery.

all vegetation using a combination of brush killer and hand labor. Once cleared the fence should be inspected and repairs made as necessary.

- Repair of the City Cemetery chain link fence and installation of a similar fence along the west boundary of Rest Haven Cemetery will enhance security in the two cemeteries.

- All plot gates should have stainless steel cabling used to attach the gate to the hinge post to reduce the potential for theft.

- The City should begin using a cemetery-specific form to identify and record evidence of vandalism.

- The City should periodically evaluate the need for policies dealing with homelessness in the cemeteries.

- Rest Haven is being used as a cut through, making it critical that both the collapsed stone wall along Fourth Avenue North and the absence of a boundary fence along Hillsboro Road be addressed.

Cemetery Fixtures and Furnishings

Boundary fences and walls, sometimes discussed under "fixtures and furnishings" have already been discussed in a separate section because of their complexity. Readers should review that previous section for additional information on the boundary fences, walls, and associated gates.

Various Amenities

City and Rest Haven cemeteries are rather Spartan in their appearance. There are, for example, no benches, vases, or urns at any of the monuments or in any of the plots.

This is not necessarily bad. The absence is certainly related to the time period of the burials at both cemeteries. Benches tend to be rather late introductions, occurring after the period when active use at both cemeteries ceased. Their absence absolves the Park Department of their maintenance – which can often be significant. In addition, benches are often attractive nuisances and we generally do not recommend their installation.

Similarly, urns and vases tend to be maintenance issues. Urns are often sold by monument companies to clients who are unaware of the upkeep. As a result, the urns often hold water, breed mosquitoes, collect trash, are turned upside down, or are just ignored. They are rarely repaired or replaced when broken. They are likely not used since most floral arrangements today come in their own plastic container, rendering the urns and vases redundant.

Since with the proposed regulations, all work – including the setting of urns and vases – must be approved, some consideration should be given to prohibiting the introduction of urns or vases in the cemetery.

There may come a time when some group wishes to place a flag pole at the cemetery. We view this as essentially an amenity and worthy of brief mention here.

Flags and flagpoles in these two cemeteries would be inconsistent with the eighteenth and nineteenth century features and designs inherent in the two properties. The City should be careful not to permit the introduction of incongruous items into the cemetery, as well as avoiding the introduction of items that require long-term maintenance. There are simply too many demands already placed on the funding ability of the caregivers.

Introduction of Additional Memorials

Various groups may wish to introduce new markers or memorials into the cemeteries. Several recent examples are present and worthy of discussion. In general, since both cemeteries are now listed on the National Register of Historic Places, the City should be very circumspect in allowing modern additions to the landscape or modifications of the existing historic fabric. It is very important that the historic context and appearance of the cemeteries be carefully maintained.

The Unknown Soldier Monument

This is an example of a monument that is out of scale with the cemetery and surrounding monuments. Its placement disrupts the natural lines of the cemetery, as well as the original drive paths. It introduces elements that would not be found in a cemetery of this type or age.

Figure 39. Introduction of new elements. Upper left shows an inappropriate style monument introduced into City Cemetery. Upper right shows the monument to the unknown soldier that is out of scale with the cemetery and all other monuments. Middle left shows recarving of a monument which damages the original historic fabric and should never be allowed. Middle right shows an acceptable flush mounted emblem that doesn't detract from the cemetery landscape. The lower two photographs show examples of inappropriate markers that should be removed since the graves are already well marked or minimally should be laid as flush lawn markers.

We mention these concerns since it is important that the City carefully review and consider any modifications in light of the Secretary of the Interior's Standards for Preservation.

Replacement Monuments

All people deserve the dignity of ensuring their grave is marked and there are times when a marker is so eroded or difficult to read that it no longer serves as an appropriate memorial.

The original marker should never be removed. Nor should it be recarved (as has occurred in several cases at City Cemetery). Instead, the original marker should be left in place and a new marker laid at its foot as a lawn marker (a horizontal plaque). The new marker may be bronze or granite as both exhibit considerable longevity. By allowing only lawn markers, the three-dimensional landscape of the cemetery is maintained, while the grave continues to be memorialized.

The new marker should contain only what is (or was) on the original marker, with the addition in small letters that it is a replacement marker erected in a particular year. This helps ensure that it is made clear that it is a recent introduction into the historic cemetery.

New Monuments

New monuments should be allowed only for new burials. These new monuments should match existing markers as closely as possible. If granite must be used, it should be limited to shades of gray (pinks, reds, blacks, and similar colors should not be permitted). Preferably lawn markers (flush-to-the-ground) should be used in order to preserve the three-dimensional appearance of the cemetery.

In addition, the City should not allow the mounting of any plaques, emblems, or other devices on historic monuments (i.e., monuments 50 years or more in age). Any organization that wishes to especially recognize an individual in the cemetery with such plaques or emblems should be allowed only to attach the devices to a granite lawn marker and place the marker flush with the ground in proximity to the existing historic marker.

Recommended Modifications to Some Existing Monuments

In Rest Haven Cemetery there are a series of bronze markers that have been placed at graves with existing markers. These new introductions, erected 2 to 3 feet above the landscape detract from the historic appearance of the cemetery. Since they are on already marked graves, they serve no purpose..

If they must remain, all should be laid flush to the ground, mounted on poured concrete pads.

Recommendations

- The City should not allow the introduction of benches, urns, or vases in the cemeteries.

- The City should also be careful to prevent other introductions that are out of character with the historic cemeteries such as flag poles or grave decorations.

- The introduction of new memorials must be very carefully monitored and limited. New monuments should be allowed only when the historic monument is no longer legible. In such cases, the original monument must remain and a new flush marker with the precise language of the original marker erected as a flush-to-ground lawn marker.

- New monuments marking new burials (if any are allowed) should match existing markers in size, material, and design. If this is not possible, then new markers should be limited to gray granite. Preferably any new marker should be erected as a lawn marker flush to the ground.

- Existing brass signs in Rest Haven Cemetery either should be removed entirely or reset flush to the ground on concrete pads.

Landscape Issues

Staffing

In the assessment questionnaire, it appears that the full time maintenance staff consists of six individuals, with one seasonal maintenance staff. However, staffing levels can fluctuate. During the growing season, for example, there are multiple staff on-site mowing about 1.5 days per week. However, the landscape staff may have only two individuals at the cemeteries twice a month.

While this is common at municipal cemeteries, it makes it almost impossible to ascertain staffing levels or to judge the appropriateness of those levels.

Size of Staff

We typically recommend two workers and one supervisor full-time per 10 acres. This is based on the Boston Historic Burying Grounds Initiative (Atwood et al. 1989) and is particularly suitable for the situation at City and Rest Haven cemeteries 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 9 acres at the two Franklin cemeteries, we would recommend a full-time staff of 3 people – dedicated to nothing other than the maintenance of these properties.

It may seem difficult to understand the work available for three individuals assigned to only these two cemeteries; that is because too many caregivers assume that cemeteries require nothing more than occasional grass mowing. Nothing could be further from the truth and it is this thinking, focusing on little more than grass mowing, which has led to the overall deteriorated conditions.

Appropriate maintenance established by good practice includes weed control, tree trimming, pruning, seasonal cleanup, maintaining the paths, conducting section inspections, survey of monuments for maintenance needs, maintenance of shrub beds, maintaining section signs, maintaining water lines, 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). Improved management and maintenance of the cemeteries will improve public confidence in the City's stewardship of these sites.

This permanent crew would also allow the City to train certain employees 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, including the collapsing stone walls.

Operating a permanent crew will also allow the employees to develop a sense of ownership and continuity. It also reduces the need to identify seasonal staff, appropriately train them, and ensure adequate oversight – only to lose those employees only a few months later.

While it is likely unheard of to assign

permanent staff to a particular site, the City should consider the benefits of such a program, given the very specific training and expertise necessary to maintain a cemetery as opposed to other landscapes areas of the community.

Job Descriptions

In the hope that the City will consider assigning specific employees to the maintenance of the two cemeteries, it may be useful to more fully understand the job descriptions appropriate for the two workers and supervisor. While it is likely that the City of Franklin already has specific job descriptions for employees, they likely are not focused on the specific needs of cemetery maintenance.

Cemetery Landscape Manager

A position such as Cemetery Landscape Manager would be appropriate for the supervisor. This may be the equivalent of the current Grounds Crew Chief.

A general statement of duties may be along the lines of, "Directs cemetery program, supervises workers in maintaining graves and equipment."

The individual should have training in equipment such as backhoe, mowers, lowering devices, compactors, trimmers, air compressors, grinders, hand and power equipment, chains, ropes, saws, paint brushes, bars, sod rollers, rakes, heaters, etc. They should also have knowledge of replacement parts, hardware, lubricants, paints, grave markers, records, and miscellaneous reports. They should also be capable of updating and maintaining computer systems.

The work environment should be specified as "Indoor/outdoor all weather conditions." The description should specify that the individual is responsible for exercising supervision over equipment operators, landscape maintenance technicians, and laborers. Physical requirements should include a statement that the individual will be responsible for manual labor including lifting and carrying heavy objects, bending, kneeling, climbing, extensive walking, and the ability to operate Cemetery equipment is required daily in the position.

Specific job duties, often referred to as "performance responsibilities," should include such items as: performs turf management; prunes trees and shrubs; responsible for maintaining cemetery grounds and equipment; directs the location of burial markers installed by other persons; plans and performs landscaping; plants new trees and removes old ones; hires, evaluates, and disciplines landscape technicians; locate graves, supervise opening of graves, internments, and reinternments when occasionally necessary; maintain time records for regular employees and other employees; make purchases in accordance with Department policy; make recommendations for equipment purchases and cemetery improvements; assure that the grounds crews' uniforms, personal appearance, actions, and demeanor present an appropriate image to families and visitors; maintain a safe working environment by training the staff in proper techniques and use of safety equipment; manages landscape contracts and contractors to ensure compliance with Department standards; and assure that the cemeteries comply with OSHA and EPA regulations and that the employees comply with appropriate regulations. As with most job descriptions, there should be a phrase noting that the list is not all-inclusive and duties will vary depending on the direction of the individual's supervisor.

Knowledge, skills, and abilities should include a minimum of two years' experience; knowledge of computer systems; understanding the rules and regulations pertaining to the cemetery, including requirements related to lots; and good public relations skills. The description should specify a thorough knowledge of turf management, plant nutrition, equipment repair and maintenance techniques, safety procedures, mechanics, and a working knowledge of mathematics.

The individual must be able to operate

tractors, backhoes, loaders, mowers, turf maintenance equipment, pruning equipment, hand tools, and other cemetery equipment. The ability to understand and anticipate problems, to enforce department safety policies and procedures, and to interpret written instructions, maps, schematics, diagrams, reports, and manuals is required. This employee should possess a strong mechanical aptitude, and excellent public relation, supervisory, organizational, oral and written communication skills. The individual must also be able to work as a team member.

The minimum qualifications should be a high school diploma or equivalent, a minimum of three years cemetery experience, prior supervisory experience in the same or related field, a valid driver's license, and a clean driving record. The job description must also make clear that continuing education in a related field is expected. It would be appropriate to note that this is a hands-on supervisory position that will manage the maintenance operations at City and Rest Haven cemeteries.

It would be ideal for this individual to hold a Tennessee Horticulture – Lawn and Turf (HTL) license (which also requires a C03 - Ornamental and Turf Commercial Certification. It may be easier for the City to have an existing license holder on staff perform these duties.

Cemetery Landscape Technician

This job description can obviously be simpler, although it should still cover all of the previous broad headings. It should indicate that the position is for semi-skilled work in general cemetery maintenance.

Essential duties might include such items as: hand rake around memorials, shrubs, trees and clean up low spots; use hand tools to dig ditches or holes; remove tree suckers and other undesirable vegetation; pick up trash; hand shovel dirt, gravel or asphalt; operate large deck mowers; operate small push mowers; service mowers; sharpen blades daily; clean equipment; wear safety equipment, including eye and ear protection; use shovel, rake, sod roller, etc.; seed and sod; weedeat using gasoline powered nylon trimmers; trash and rubbish removal; chipping vegetative debris; general clean-up of grounds; washing mowers and equipment; general clean-up of tools and return to proper place; light carpentry and painting; repositioning or resetting memorials; and running errands (fill gas cans, obtain parts, etc.).

Knowledge, skills, and abilities should specify that the individual must be at least 18 years old; must have a valid driver's license; must have and maintain a satisfactory driving record; must have the ability to perform the cited tasks; must be able to work 40 hours a week, plus overtime if required; ability to arrive at work on time; and ability to maintain a regular and reliable level of attendance.

The work environment should be specified as "Indoor/outdoor all weather conditions." Physical requirements should include a statement that the individual will be responsible for manual labor including lifting and carrying heavy objects, bending, flexing, twisting, stooping, crouching, kneeling, climbing, extensive walking, and the ability to operate Cemetery equipment is required daily in the position.

Job Oversight

Regardless of the credentials or certification, the complexities of cemetery maintenance require that the technicians are well supervised and are held accountable for their performance. It is especially important, therefore, that the supervisor(s) be carefully defined. The selected individual(s) must not only be well trained and knowledgeable, but also possess demonstrated supervisory experience. The supervisor(s) must be expected to work alongside the crews on a daily basis.

Cemetery Maintenance Inspection Form

Cemetery:_____ Date:_____ Inspected By:_____

Elements	Issues	Good	Requires Attention	Not Applicable	Comments/Location
LAWNS	General Appearance				
	Mowing Height				
	Water/Moisture				
	Edging/Trimming				
	Pest/Disease Control				
	Weed Control				
	Fertilization				
	Other				
BEDDING PLANTS & PLANTERS	Plant condition				
	Water/Moisture				
	Pest/Disease Control				
	Cultivation				
	Staking				
	Dead Heading				
	Trimming				
	Fertilizing				
	Weed Control				
	Edging				
	Mulching				
	Other				
PERENNIALS & GRASSES	Plant Condition				
	Water/Moisture				
	Pest/Disease Control				
	Cultivation				
	Staking				
	Dead Heading				
	Trimming				
	Fertilizing				
	Weed Control				
	Edging				
	Other				

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Elements	Issues	Good	Requires Attention	Not Applicable	Comments/Location
SHRUBS & GROUNDCOVERS	General Condition				
	Water/Moisture				
	Pest/Disease Control				
	Pruning				
	Shearing				
	Trimming				
	Weed Control				
	Cultivation				
	Fertilizing				
	Mulching				
	Other				
TREES	General Condition				
	Water/Moisture				
	Pest/Disease Control				
	Edging Wells				
	Mulching				
	Pruning				
	Repair				
	Hazards				
	Plant Support				
	Stakes/Wires/Anchors				
	Base Damage/Girdling				
	Fertilization				
	Other				
IRRIGATION	Heads/Risers				
	Pressure				
	Coverage				
	Controller Settings				
	Leaks				
	Other				
DRAINS/DITCHES	Debris				
	Pollution				
	Other				
FURNISHINGS & FIXTURES	Damage				
	Dirty				
OTHER					

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Figure 40. Form that can be adapted by the Cemetery Landscape Manager as a monthly report on conditions.

The Cemetery Landscape Manager should be responsible for providing the City with a written monthly report itemizing activities during the month. This document need not be extensive; Figure 40 provides a brief list that may be helpful.

Staff Hiring and Continuity

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.

The City must evaluate mechanisms for obtaining this continuity.

Staff Training

We are told that staff are trained during their orientation on job specific equipment and those assigned to the cemeteries receive "training specific to the cemeteries." Several of the Parks Department members have received training from the Dry Stone Conservancy.

A horticultural degree is a significant asset in cemetery landscape management, as is membership in professional organizations such as the Professional Grounds Maintenance Society (PGMS).

We understand that the City has an arborist who is International Society of Arboriculture (ISA) Certified. 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.

Since the cemetery will require considerable involvement of an arborist in evaluating and maintaining tree health, as well as ensuring proper pruning, it may be that the City will need to contract out some work. There are two Certified Arborists in the Franklin area that the City could contract with if needed (Table 2).

The PGMS offers certifications for both managers and technicians. It also offers the PGMS Landscape Management and Operations Accreditation.

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). There is a local chapter in Nashville. 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 turf grasses 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

Table 2.
ISA Certified Arborists in Franklin, Tennessee

Name	Company Name	Telephone
Martin Shaw	Green Season Consulting	615-794-4377
Tom Powers	Powers Technology	615-642-9577

physiology, health care management, and establishment.

The University of Georgia has developed several exceptional training programs readily available either on-line or through DVDs. One is the SuperCrew series that provides professional training developed in cooperation with industry leaders and endorsed by professional organizations. Topics range from "Being Safe with Grounds Equipment" to "Pruning Ornamentals."

The training is available through either nine DVD programs that can be used to train staff on-site or through individual on-line enrollment. The former has a cost of $470, although the DVDs can be used to train an unlimited number of individuals and include both English and Spanish scripts. The second option allows a single individual to take the nine lessons self-paced for a total of $170. The latter option allows the individual to receive a Certificate of Completion after successfully completing the online quizzes. Additional information is available at http://www.supercrew.caes.uga.edu/.

We encourage the City to support staff seeking certifications and additional training. In fact, the City should not simply provide opportunities for its staff to become certified in different areas, but must insist on continuing education and training for all employees.

While out of Tennessee, we encourage participation in the Georgia Municipal Cemetery Association (http://www.gmcaweb.org/) as another means of obtaining further training and exposure to the issues specific to municipal cemetery management and maintenance.

General Employee Behavior

While the City already has rules regarding employee behavior, cemeteries are special places and work in cemeteries may require supplemental employee guidance. For example, no employee should sit, lean or place any item on headstones or markers and should never place or lean equipment on any headstone or marker.

Cemetery Soil

The City reports that no soil sampling for turf or trees is currently conducted at either City or Rest Haven cemeteries. Commercial analysis is no more than $10 per sample and it is impossible to manage vegetation in the cemetery if there is no data on the condition of the soils.

It is good practice to test soils every three to five years and we recommend this practice begin immediately. A simple tutorial on soil sample collection is provided at http://www.caes.uga.edu/applications/publications/files/pdf/C%20896_4.PDF.

For this assessment samples were collected from City Cemetery, the north half of Rest Haven Cemetery, and the south half of Rest Haven Cemetery. Analysis was conducted by A&L Eastern Laboratories. The results of these tests are provided in Figure 41.

The soils have moderate to relatively cation exchange capacity (between 12.7 meg/100g at City Cemetery and as high as 28.5 meg/100g at Rest Haven Cemetery). The cation exchange capacity is the maximum quantity of total cations, of any class, that a soil is capable of holding, at a given pH value, available for exchange with the soil solution. It is used as a measure of fertility and nutrient retention capacity, and in general, the higher the number, the higher the soil fertility. The cation exchange capacity can be improved with the introduction of humus and organic matter. The results of this study show that all of the tests soils are able to retain nutrients and thus are relatively fertile.

Nevertheless, organic matter is not especially high, ranging from only 4.6% in City Cemetery to as much as 12.1% inRest Haven Cemetery. The soils would benefit from soil amendments, although this is difficult to accomplish in turf soils. More important than the current levels are changes over time – providing another reason by periodic testing is beneficial.

At City Cemetery the soil pH is 5.8. Most

plants prefer levels from 5.8 to 7.0, so this is just within the acceptable range, but certainly not optimal. At Rest Haven Cemetery the soil pH ranges from 5.7 to 7.0, suggesting considerable variation.

Liming is recommended at City Cemetery and in the northern half of Rest Haven in order to increase the soil pH and promote greater microbial activity. Recommendations for liming are shown in Table 3.

Phosphorus (P) levels are high in all three samples. This is not surprising since the soils were all formed in phosphatic alluvium. Phosphorus is essential for photosynthesis, seed and fruit production, plant energy production, and cell division. Adequate supplies will promote root growth and formation, greater flowering and seed production, better growth in cold temperatures, and efficient water use.

Potassium (K) is also essential in photosynthesis, plant growth, and effective response to drought stress. Like phosphorus, it tends to be reduced by low pH and low cation exchange capacities. Thus, it is not surprising that it is relatively high in the south half of Rest Haven Cemetery where the soil pH is neutral, but low in the north half of Rest Haven and City cemeteries, where soil pH is acidic. Balancing soil pH will likely improve potassium levels.

Calcium and magnesium levels range from low to high. The reason for this is not known. In general, all three are affected by the soil acidity and the low cation exchange capacity. Finally, we tested for soluble salts. These may be contributed by road salts, but are common is virtually all commercial fertilizers. They can affect not only the plants, but also the stones at the cemetery. Soluble salt levels were between 0.1 and 0.32 mmho/cm and these levels are considered very low.

According to the soil surveys, all of the soils in the cemeteries are silt loams. Our analysis of soil texture reveals some variation. The soils tested in City Cemetery were silt loams (with 52.8% silt), but those from Rest Haven Cemetery varied from a sandy loam in the southern half of the property (with 56.4% sand) to loam in the northern half (where the sample reveals 44.4% sand and 44.8% silt).

This brief discussion reveals that the availability of many plant nutrients is being affected by the low soil pH. Thus, while fertilizers could productively be used in several areas, we recommend instead that an effort first be made to raise the pH and then conduct additional soil tests to further evaluate macro and micronutrient levels.

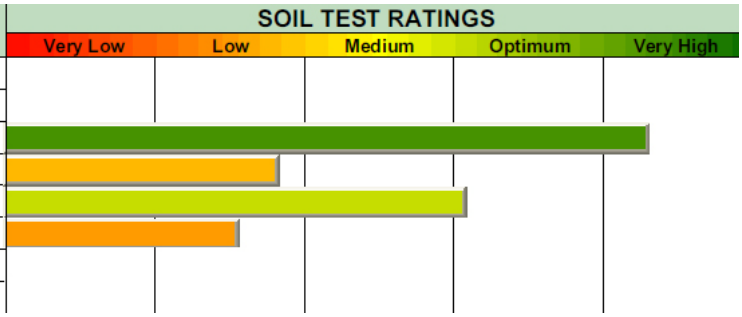
If fertilizers are to be applied, based on the current soil tests the recommended levels are 10 pounds per 1,000 square feet of 10-0-20 at City Cemetery, 6 pounds per 1,000 square feet of 21-0-0 in the south half of Rest Haven, and 10 pounds per 1,000 square feet of 10-0-20 in the north half of Rest Haven Cemetery.

Table 3.
Recommended Liming for Turf Areas

Section	Lime (lbs/1000 ft^2)
City Cemetery	30
Rest Haven N½	98
Rest Haven S½	0

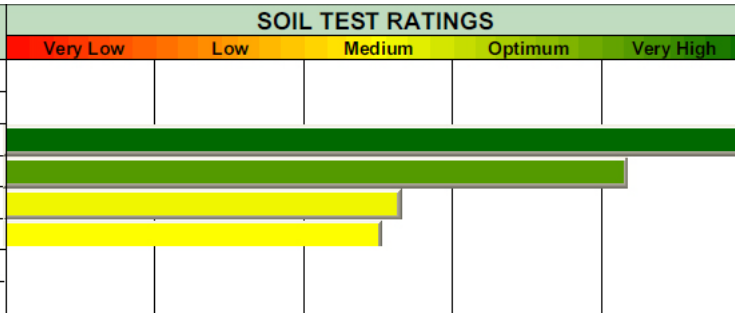
If future fertilizers are to be applied now or in the future, slow release organic fertilizers are preferable to commercial inorganic fertilizers since they have significantly lower salt indices. An excellent source explaining the differences between organic and inorganic fertilizers is http://www.cmg.colostate.edu/gardennotes/234.pdf. The publication at http://www.caes.uga.edu/applications/publications/files/pdf/C%20853_3.PDF provides information on converting traditional inorganic fertilizer recommendations to safer organic recipes.

Test	Results	
Soil pH	5.8	
Buffer pH	6.69	
Phosphorus (P)	140 ppm	
Potassium (K)	75 ppm	
Calcium (Ca)	1804 ppm	
Magnesium (Mg)	124 ppm	
Soluble Salts	0.1 mmhos/cm	
Organic Matter	4.6 % ENR 124	



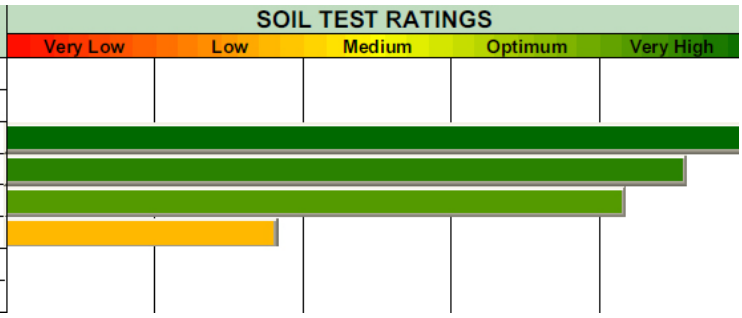
City Cemetery

Test	Results	
Soil pH	5.7	
Buffer pH	6.57	
Phosphorus (P)	310 ppm	
Potassium (K)	200 ppm	
Calcium (Ca)	2172 ppm	
Magnesium (Mg)	253 ppm	
Soluble Salts	0.26 mmhos/cm	
Organic Matter	6.8 % ENR 150	



Rest Haven N½

Test	Results	
Soil pH	7.0	
Buffer pH		
Phosphorus (P)	369 ppm	
Potassium (K)	304 ppm	
Calcium (Ca)	5021 ppm	
Magnesium (Mg)	312 ppm	
Soluble Salts	0.32 mmhos/cm	
Organic Matter	12.1 % ENR 150	



Rest Haven S½

Figure 41. Soil sample results.

Figure 42. Pecan tree at City Cemetery. Upper photo shows splits in the bark and piles of branches at the base. Lower photo shows drooping branches on monuments.

City Cemetery

Cemetery Trees

Trees are limited to a centrally located specimen pecan (*Carya illinoinensis*) and scattered pines (probably shortleaf pines, *Pinus echinata*) in the eastern half. Eubank et al. (2010:8) insist that the pecan is an intentional planting, although there is no real evidence to support this, while they suggest that the pines, "not arranged in any particular order," were likely volunteer trees. It seems unlikely that so many of a single species would be found, but we suppose it is possible.

The pecan is an excellent specimen tree. It is an American native with a uniform, symmetrical, broadly oval crown. Pecans will typically grow 70 to 100 feet tall with a spread of 40 to 75 feet. They exhibit large major limbs growing up and out from the trunk in a distinctive upright, spreading fashion. The pecan also exhibits a high drought tolerance.

Nevertheless, the pecan is not an especially good cemetery tree and doesn't appear to be highly recommended for planting by the City. The fruit, twigs, and foliage cause significant litter – an issue that is immediately obvious at City Cemetery. Surface roots tend to lift monuments and interfere with mowing. The tree is sensitive to a variety of pests and diseases. Finally, the wood itself tends to be weak and susceptible to breakage. This last issue can be minimized if the tree is pruned to a central leader early. This adds longevity and greater safety since well-spaced limbs are better attached to a tree than those that cluster together.

Given the potential problems this tree may exhibit – as well as its extraordinary importance as a central cemetery element – we strongly recommend that the tree be carefully evaluated by a certified arborist and a management program developed.

We also recommend that the tree be pruned in order to remove dead wood and to raise the crown in order to remove branches from monuments. It is also important that downed branches and other litter be removed from under the tree to help minimize disease and pests.

The adaptability of the shortleaf pine at least partially accounts for its wide distribution. It is listed as an acceptable, and drought resistant, species on the Franklin tree list. They exhibit relatively few problems. The wood tends to be strong and they don't have root problems that would affect monuments (although most are located in areas with few monuments at City Cemetery).

Selection Issues

Cemeteries, in general, have historically been dominated by large deciduous trees, although evergreens such as cedar are also very common. The trees provide a distinctly inviting image for visitors and passersby. They also provide some visual separation from adjacent buildings – especially in cluttered urban environments. They provide shade, reduce stormwater runoff, stabilize soil, and reduce evaporative water loss.

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.

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, ginkgo, 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).

For Franklin we also assume some limitations are placed on selections by the City's tree and plant list.

Obviously, there is no such thing as a perfect tree. Many of the historically appropriate species have significant problems as shown in Table 4. At least some of these problems, however, can be overcome through judicious placement, appropriate planning, and careful early pruning.

Replanting

Trees should be replanted as older ones are removed and a general effort should be made to plan for future tree replacement, perhaps using a mix of fast-growing but short-lived trees intermixed with slow-growing but long-lived trees to create a planned appearance.

It is also appropriate to plant replacement trees in anticipation of their need, allowing them an opportunity to become established before the diseased or damaged tree is removed.

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. Fine-textured mulches prevent evaporative water loss better than coarse-textured mulches. This is a practice that could be productively employed at the City Cemetery, especially under the pecan tree. Staff

Table 4.
Comparison of Historically Appropriate Trees That Might Be Used in the Franklin Cemeteries

Common Name	Scientific Name	Origin	Cultivation			Size (HxS)	Litter	Breakage	Roots	Notes
			Zone	Light	Drought					
Norway Maple	*Acer platanoides*	Exotic: 1792	4-7A	PS-FS	M	40-60x35-40	None	Resistant	Problem	"foliage gives rash effects of color"
Silver Maple	*Acer saccharinum*	Native: 1735	3-9	PS-FS	H	60-80x40-60	Moderate	Weak	Problem	"next to the American Elm in beauty and desirability"
Sugar Maple	*Acer saccharum*	Native: 1735	3-8A	S-FS	M	50-80x35-80	None	Resistant	No Problem	Excellent colors through all seasons; frequently used for ornamental plantings
River Birch	*Betula nigra*	Native: ?	4-9A	PS-FS	M	40-50x25-35	None	Resistant	No Problem	Plant and prune to form a single trunk specimen
American Ash	*Fraxinus americana*	Native: 1724	3-9A	PS-FS	M	50-80x40-60	Moderate	Weak	Problem	Not tolerant of urban soils or heavy clay
Green Ash	*Fraxinus pennsylvanica*	Native: 1724	3-9A	FS	H	60-70x45-50	Moderate	Weak	Problem	"very ornamental and worth transplanting:' should be grown with a single leader
Eastern Red Cedar	*Juniperus virginiana*	Native: 1664	2-9	PS-FS	H	40-50x10-20	None	Weak	No Problem	Traditional cemetery tree; planted for "perfect columnar growth"
Norway Spruce	*Picea abies*	Exotic: 1771	2B-7A	FS	M	80-100x25-40	None	Resistant	No Problem	"extensively planted"
White Oak	*Quercus alba*	Native: 1724	3B-8	PS-FS	M	60-100x60-80	Moderate	Resistant	No Problem	A northern oak; was a favored tree, however
Red Oak	*Quercus rubra*	Native: 1783	5-8A	FS	H	60-70x50-60	Moderate	Weak	Problem	Not as popular as elm and maple
Post Oak	*Quercus stellata*	Native: ?	6-9A	FS	H	40-50x35-50	Moderate	Resistant	No Problem	Not widely available in nurseries
Weeping Willow	*Salix babylonia*	Exotic:1730	2-9A	PS-FS	H	45-70x45-70	Moderate	Weak	Problem	Roots are especially aggressive
Arborvitae	*Thuja occidentalis*	Native: 1536	2-7	PS-FS	M	20-40x10-12	None	Resistant	No Problem	Good screen or hedge plant; not commonly used as a specimen tree
American Linden	*Tilia americana*	Native: 1752	3-8	PS-FS	M	50-80x35-80	Moderate	Weak	No Problem	Good specimen tree; typically more formal landscape
American Elm	*Ulmus americana*	Native: 1670	2-9	PS-FS	M	70-90x50-70	Moderate	Weak	Problem	Dirr recommends "Valley Forge," "New Harmony," and Princeton" as respectably disease tolerant
Leyland Cypress	*x Cupressocyparis leylandii*	Exotic: ?	6-10A	PS-FS	H	35-50x15-25	None	Resistant	No Problem	clumps or buffers

Key:
Light: S = shade; PS + partial shade; S = sun; FS = full sun
Drought: M = moderately tolerant; H = highly tolerant
Size: height by spread in feet
Roots: reflects the presence of surface roots capable of lifting stones
Species in red are permitted by the City of Franklin
Data from USDA, Forest Service Plat Fact Sheets, Adams (2004), Dirr (2011), Simonds (1917)

should be closely supervised to prevent over mulching of vegetation.

All replacement trees or new plantings 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). Since there is no water at City Cemetery, new trees must be provided water bags. There are a variety of water bags for young trees, including the Treegator (http://www.treegator.com/home/). In fact, bags are now readily available in big box stores. Their use will require the City to acquire a water tank, but the City may already have this equipment.

Special care should be exercised to prevent bark damage from mowers and trimmers. We recommend the use of tree guards (http://www.amleo.com/tree-bark-protectors/p/VP-BG/).

Tree Maintenance

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

The City does not water mature trees, relying instead on rainfall. While this is typically acceptable, the landscape plan should include provisions for deep-root water during periods of severe drought (assuming this is permissible). 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 also reports that no mature tree fertilization is conducted, presumably because of the funds required. The pecan tree in particular is a vital component of the landscape. It represents part of the historic fabric and steps must be taken to protect that aspect of the landscape and vista. A certified arborist can determine if a feeding program would benefit this tree.

Based on the recommendations of an ISA Certified Arborist, the City should anticipate periodic fertilization of mature trees. Fertilization should be conducted on the basis of need as 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 is essential.

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 uses 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 Franklin this is typically from the spring, after new leaves emerge, through mid-season. Fertilizer should not be applied late in the season, during the winter, 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.

While we defer to an inspection by a

Figure 43. Additional tree problems in City Cemetery. Upper photos show dead wood in pines that requires pruning. Lower left photo shows a limb correctly pruned (blue arrow) and an incorrectly pruned limb that left a stub (yellow arrow). Lower right photo shows caterpillar tents in the pecan tree.

Certified Arborist regarding specifics of tree health at City Cemetery, we have noted that the pines require careful pruning. We found examples of both proper and improper pruning leaving stubs 2 to 4 feet from the collar, and many of the trees contain abundant dead wood. They 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. 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 cemetery should be performed by or under the supervision of an ISA Certified Arborist.

Trees should be inspected for potential threats to monuments, as well as general health.

Figure 44. Shrubs and undesirable vegetation. The upper left photo shows a yucca taken over by undesirable vegetation. The upper right shows yuccas, one of which has been mowed. The middle left photo shows vegetation growing up in an iron fence. Without removal, it will destroy the fence. Middle right photo shows trees growing out of a broken box tomb. The two lower photos show vines and other undesirable vegetation taking over the interiors of box tombs. All of this invasive vegetation must be removed.

Ideally these inspections should be made yearly and after any storm where the winds exceed 55 mph. They should be pruned to remove potentially hazardous dead wood on a yearly basis, but safe pruning every 5 years by a certified arborist is acceptable.

During this assessment we observed that the Pecan tree has been colonized by a tenting caterpillar. The pecan also evidenced abundant carpenter ants, indicating wood rot. These problems should be further evaluated.

Shrubs and Undesirable Vegetation

City Cemetery appears to have few shrubs planted by families. Unfortunately most of those are today in poor condition, being largely over-run by undesirable vegetation and in desperate need of careful restoration pruning.

We have previously discussed the need to remove all of the vegetation, including trees under 4-inches dbh along the north chain link fence. This will not be further referenced in this section.

Selection and Planting

Most shrubs appear to be individual specimens, probably anticipated to serve as accents. The only intentional plantings identified in City Cemetery are yucca, although it is likely that others exist, but simply cannot be distinguished among the other undesirable plants that have grown up around them (Figure 44).

Because of the low incidence of shrubs, little needs to be done except to ensure that they are not run over by mowers. The larger task is the removal of the undesirable vegetation that has been allowed to take over box tombs, grow in fence lines, and even take over legitimate plantings. These plants must be cut down to the ground and the stumps painted with a full-strength herbicide such as Round-up, Garlon, or Tordon to prevent their return.

Turf and Mowing

City Cemetery does not exhibit a good stand of turf. While there are areas with both Bermuda and fescue, much of the turf consists of broadleaf weeds (Figure 45).

The City reports the use of a granular preemergent herbicide in the Spring at the rate of 5 pounds per 1,000 square feet. Although this treatment may have been applied only once or twice with the Parks Department taking over maintenance, it does not appear to have had much of an impact. It may be appropriate to combine the effort with one or more postemergent applications. An excellent guide for Tennessee is available at http://www.tennesseeturfgrassweeds.org/admin/Lists/Fact%20Sheets/Attachments/12/PB1789_editedJan2011.pdf.

Mowing at City Cemetery is conducted primarily by two mowers, a John Deere 60-inch zero turn mower and an Exmark stand-on mower with a 36-inch deck.

These represent very large deck mowers to be used in historic cemeteries and even a zero turn mower can prove difficult to operate among closely spaced monuments.

Stones in the cemetery clearly reveal the damage that can be done by large equipment combined with less than perfect handling. We even have observed tire marks on monuments, where they have been run over by mowers (Figure 46). We admit that it is difficult to distinguish recent mower damage from the damage done over years of less than ideal maintenance, but the whiter the impact area, the more recent the damage.

Regardless, we recommend limiting large deck mowers to only the large open areas in the eastern half of the cemetery and convert mowing in the remainder of the cemetery to walk behind mowers with decks no larger than 21-inches.

Since Tennessee is in a transition zone between cool and warm season grasses, proper

mowing height for Bermuda and fescue depends on current weather conditions.

In cool and humid weather conditions, tall fescue is typically cut to a height of 2 to 3-inches and Bermuda is cut to a height of 1 to 2-inches. During hot and dry conditions, when grasses are under stress, it is appropriate to raise the cutting height, with fescue cut to 2½ to 3½-inches and Bermuda cut to 1¾ to 3 inches. Research reveals that grasses maintained at higher mowing heights have deeper root systems and improved drought tolerance. In addition, raising the mowing height of warm-season grasses as fall approaches will help the grass better over-winter.

It is good practice to increase the mowing height for grass growing in the shade. This allows for more leaf area to intercept as much available light as possible. In addition, leaf blades in shaded areas will be longer and narrower and a lower cutting height will cause an excessive reduction in leaf length.

Figure 45. Weedy turf at City Cemetery.

In cases such as City Cemetery where there are no pure stands, it is reasonable to arrive at a compromise of cutting height, perhaps ranging from 2-inches in cool weather to 3-inches in warm weather (the bulk of the growing season).

It is also essential that blades be sharp to ensure that mowing cuts grass blades rather than tearing them. As Figure 47 shows, while the blades could be sharper, there is not a great deal of tearing.

Mowing is conducted every week during the roughly 10 month growing season. The frequency of mowing is at least partially the result of the abundance of broadleaf weeds that grow more quickly than either the Bermuda or fescue, making the grass look ragged.

There were a few areas where we observed scalping. Many of these areas are the result of large deck mowers being used where there are many sunken graves, resulting in uneven ground surfaces. 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

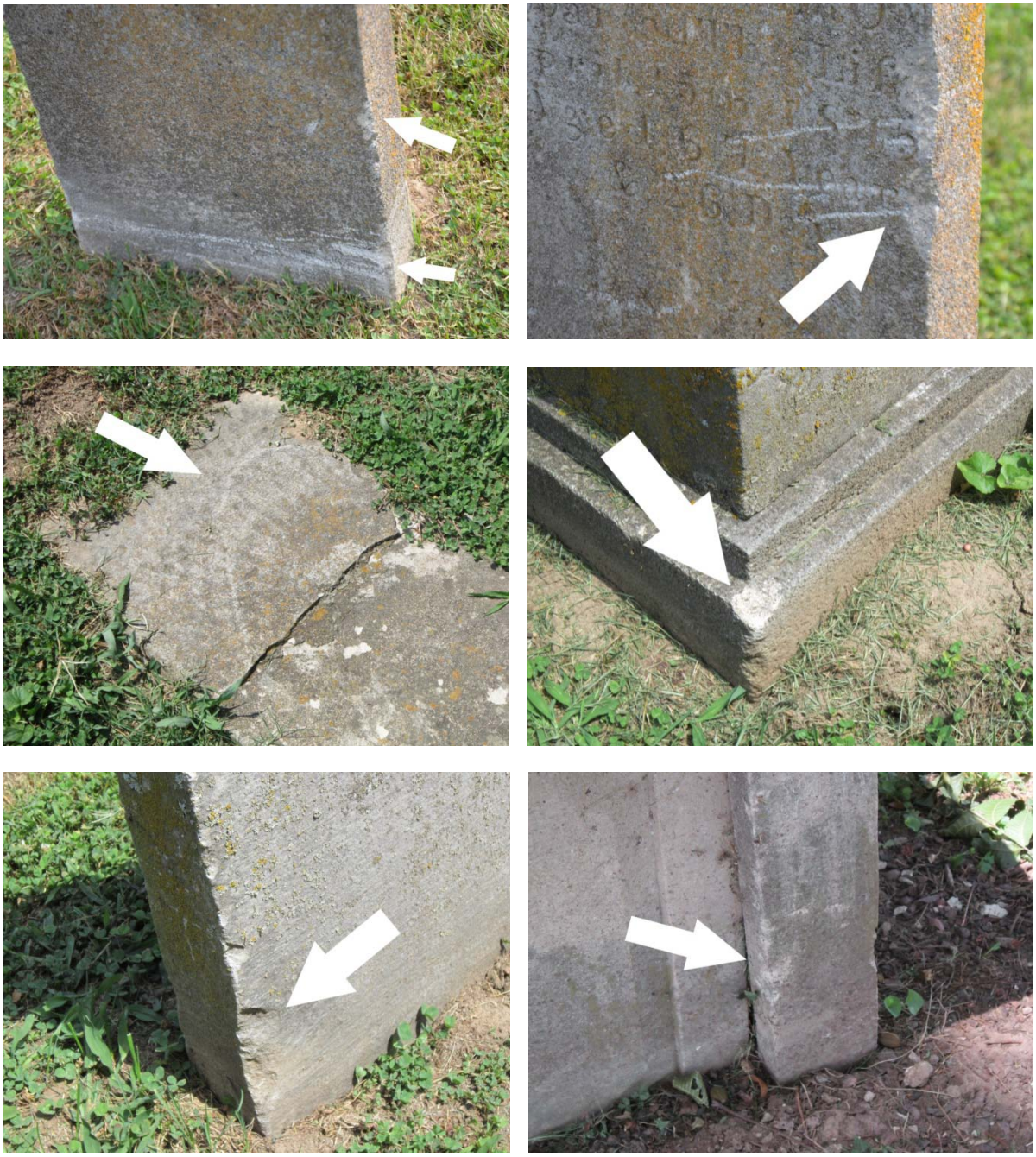


Figure 46. Mowing issues at City Cemetery. Upper left shows scrapes at ground level from mower guards. Upper right shows scrapes from riding mowers. Middle left shows tire tracks across a broken stone. Middle right shows edge damage to a base. Lower left shows edge damage to a headstone. Lower right shows edge damage to a box tomb from mower impacts.

Figure 47. Mower blades could be sharper, but there is relatively little tearing of the grass at City Cemetery.

weed and disease problems.

In addition to mowing, nylon trimmers are used around monuments, coping, fencing, and plantings. This 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.

We observed two line weights being used. One was a round line 0.080 inches in diameter. The other is a line with four edges, intended to provide greater cutting power. This line is 0.105 inches in diameter.

Lines this thick can cause extensive, and unnecessary, damage to stones. We recommend a line diameter no greater than 0.065-inch. If the trimmers being used cannot accept line with this diameter, then the lightest weight line possible should be used.

In addition to carefully training staff on proper mowing and trimming, there are several additional steps that can be taken to minimize problems.

We recommend that the edges and sides of each mower be painted a different color. This will transfer when stones are hit and it will be possible to determine who caused the damage.

A second step that can be taken is to install closed cell foam pad attached to the sides and front edges. This bumper will help to minimize accidental damage and its damage will also provide evidence of impacts.

Finally, the City must establish a clear rule that no monuments in the cemetery should be mowed over. City Cemetery is not a lawn park cemetery and its monuments are not meant to be driven over. This includes driving over ledgers – on which we observed many tire tracks. This is not only hazardous since not all of these ledgers are well supported, but it is disrespectful to the plot owners.

We were informed that all grass clippings were blown off stones and this is certainly the expected practice. It demonstrates pride in work, attention to detail, and respect for the monuments and families.

Throughout the cemetery we observed bare spots. These areas require renovation as discussed below.

Irrigation

City Cemetery lacks 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.

Unfortunately, City Cemetery also lacks

Figure 48. Examples of a bare spots in the cemetery. In the upper photo there is a fallen monument almost totally covered by soil.

functional hose bibs. This absence of readily accessible water in the cemetery poses a variety of problems. It severely limits the potential for landscape modifications, new plantings, and irrigation of stressed areas. It limits the ability to clean stones. Families must bring water to their plots for flowers and plants.

Consequently we recommend that several water bibs be installed. With only three bibs being installed – one at each of the existing entrances (east, west, and south), all parts of the cemetery could be reached with no more than 200 feet of hose. Each of these lines could be laid from existing street lines with no disturbance to the cemetery walls or any graves.

We recommend the use of Woodward sanitary hydrants, which would provide back flow prevention, frost proofing to a depth of 2-3 feet, and would allow the water to remain on during the winter and still prevent freezing. Although more expensive than conventional hydrants, these would eliminate the need for winterizing the system.

Renovation

We recommend that the cemetery implement a renovation program in order to establish a good stand of a single grass type. This work can be accomplished section by section, gradually implementing the efforts throughout the cemetery.

The City has expressed a preference for fescue, which we readily understand and support. Bermuda is somewhat more complex to maintain, requiring more fertilization, thatch control, and more frequent mowing. Bermuda also tends to look significantly better if mowed with a reel-type mower. As a result, a fescue turf is likely a better choice should there be efforts to renovate the turf. We recommend that the use of fescue be coupled with mulching under trees and shady areas where almost no grass will grow. There are a variety of

Figure 49. Magnolia at the east side of the cemetery. The photo on the left shows the hollow trunk. The right photo shows the abundant dead wood in the canopy that requires removal if the tree is not being removed.

fescue options (https://utextension.tennessee.edu/publications/Documents/W159-E.pdf), although a tall fescue blend would be our recommendation. The City probably has a preferred seed and we endorse using what is known and has been found effective in the past.

Tennessee lacks a good overview of the renovation process. The publication *Lawns in Georgia* (http://extension.uga.edu/publications/files/pdf/B%20773_2.PDF) provides information on renovation of existing turfgrass areas.

Rest Haven Cemetery

Cemetery Trees

Te center of this cemetery includes mature magnolia (*Magnolia sp.*) and hemlock (probably *Tsuga canadensis*) trees; to the east are small pines (*Pinus sp*., probably *P. echinata*) and deciduous trees, while a variety of hollies and other small shrubs or trees are scattered along the west border. The two Bradford pear trees (*Pyrus calleryana* 'Bradford') that flanked the entrance in 2006 were recently removed as a result of storm damage and were not replaced.

Although Eubanks et al. (2010:25) suggest that many of the trees here were planted and the landscape "reflects the Rural Cemetery Movement aesthetic," this should be interpreted with caution. There seems to be little evidence of a planned landscape here, anymore than there is one at City Cemetery. In fact, many of the trees in Rest Haven appear to have been planted in past 20 years.

Magnolias are not an especially good cemetery tree, primarily because of their litter. Historically this problem was resolved by allowing branches to droop and not limbing up specimen trees. This allowed the litter to remain hidden and serve as mulch. Today, most magnolias are limbed up to improve security and prevent hiding places, with the result that the tree's abundant litter becomes a significant issue.

At Rest Haven Cemetery the magnolia along the eastern side of the cemetery is in poor

health. The entire interior of the trunk is hollow, and there is very little live tree surviving. If the tree were to fail it would likely do considerable damage to either the wall or adjacent stones. We recommend that the tree be removed. If it is allowed to remain, it requires extensive pruning to remove the abundant dead wood in the canopy.

We understand that the sycamore (*Platanus occidentalis*) at the southwest corner of the cemetery has been seriously injured by the Hillsboro Street renovations. While sycamores are

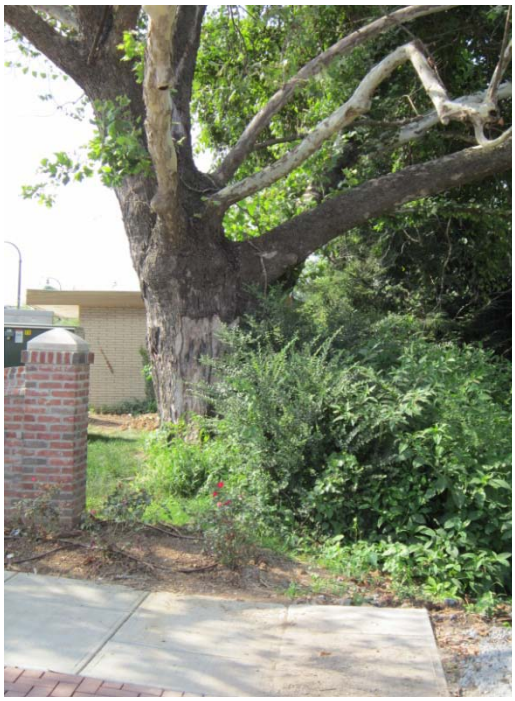


Figure 50. Dying sycamore at the southwest corner of the cemetery.

not ideal cemetery trees, this is a significant landscape feature and we regret the need to remove the tree.

Selection Issues

We have previously discussed how trees are historically appropriate at cemeteries and how they soften the landscape. This is just as true for Rest Haven Cemetery where the absence of trees gives anything but a restful appearance. A tree planting program would dramatically improve the landscape vista. Table 4 provides a range of trees that are both appropriate to cemetery landscapes and approved by the City of Franklin.

Trees should not be limited to the largely open northern end of the cemetery, but should also be selected for planting where the sycamore and magnolia may be removed, as well as other areas in the more densely populated portion of the cemetery.

Replanting

Trees should be replanted as older ones are removed and a general effort should be made to plan for future tree replacement, perhaps using a mix of fast-growing but short-lived trees intermixed with slow-growing but long-lived trees to create a planned appearance.

It is also appropriate to plant replacement trees in anticipation of their need, allowing them an opportunity to become established before the diseased or damaged tree is removed.

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. Fine-textured mulches prevent evaporative water loss better than coarse-textured mulches. This is a practice that could be productively employed at the Rest Haven Cemetery, especially under the magnolia trees. Staff should be closely supervised to prevent over-mulching of vegetation.

All replacement trees or new plantings 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). Since there is no water at City Cemetery, new trees must be provided water bags. There are a variety of water bags for young trees, including the Treegator (http://www.treegator.com/home/). In fact, bags are now readily available in big box stores. Their use will require the City to acquire a water tank, but the City may already have this equipment.

Special care should be exercised to prevent bark damage from mowers and trimmers. We recommend the use of tree guards (http://www.amleo.com/tree-bark-protectors/p/VP-BG/).

Figure 51. Improper cutting of stumps. Stumps should be cut flush to the ground and allowed to gradually decay. Stump grinders should never be used in the cemetery.

Tree Maintenance

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

The City does not water mature trees, relying instead on rainfall. While this is typically acceptable, the landscape plan should include provisions for deep-root water during periods of severe drought (assuming this is permissible). 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 also reports that no fertilization of mature trees is conducted, presumably because of the funds required. Based on the recommendations of an ISA Certified Arborist, the City should anticipate periodic fertilization. Fertilization should be conducted on the basis of need as 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 is essential.

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 uses 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 Franklin this is typically from the spring, after new leaves emerge, through mid-season. Fertilizer should not be applied late in the season, during the winter, 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.

While we defer to an inspection by a Certified Arborist regarding specifics of tree health at Rest Haven Cemetery, we have previously noted that the magnolia, if retained, requires pruning. Considerable dead wood is also found on other trees in the cemetery and they, too, require pruning for either thinning or cleaning.

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. 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 cemetery should be performed by or under the supervision of an ISA Certified Arborist. We noted that not all pruning had been conducted properly.

Trees should be inspected for potential threats to monuments, as well as general health. Ideally these inspections should be made yearly and after any storm where the winds exceed 55 mph. They should be pruned to remove potentially hazardous dead wood on a yearly basis, but safe pruning every 5 years by a certified arborist is acceptable.

We observed a variety of other problems among the trees at Rest Haven Cemetery, almost all relating to the condition of the original nursery stock or the manner in which the trees were originally planted.

Foremost among these problems are the number of trees that exhibit griddled roots. Although this topic is not addressed in the American Standard for Nursery Stock (ANSI Z60.1), it is commonly recognized that girdled or encircling roots can choke off vascular tissues, leading to decline and even death. Good practice dictates that prior to planting roots should be closely inspected and if closely matted, they should either be teased apart or cut in two places to stop the circling. We observed this problem in a number of trees at Rest Haven Cemetery.

We also observed examples of nylon bagging or string that was left on the root balls during planting, as well as remnant guying hose.

Good practice demands that binding twine be cut and bags folded down to permit unhindered growth of roots. Staking of trees is often not necessary and can even have detrimental effects on tree development; in no case should staking material be left on the trunk of the tree.

The observations suggest that substandard practices have characterized planting at Rest Haven Cemetery. The City must be certain that these past practices are improved.

Shrubs and Undesirable Vegetation

We observed no intentionally planted shrubs in Rest Haven Cemetery and this is a little surprising for what has elsewhere been reported as a Rural Cemetery landscape.

Figure 52. Additional tree issues at Rest Haven Cemetery. Upper left shows a cedar with an abandoned strap left in place. Note also improper pruning that left a stub. Even during pruning no effort was made to remove the choking strap. Upper right shows a tree with a weak crotch and girdling roots. Middle left shows nylon strings from balled roots left in place. Middle right shows multiple girdling roots. Lower left shows girdled roots. Lower right shows dead and dying branches on a tree requiring pruning.

Figure 53. Undesirable vegetation in Rest Haven Cemetery. Upper left shows vegetation and vines along the west border of the cemetery. Upper right shows a portion of the cemetery being taken over by undesirable vegetation. Lower left shows poison ivy climbing up a plot corner post. Lower right shows vines taking over a tree.

What we did observe and have previously discussed is the abundant undesirable vegetation that has been allowed to grow up along the west boundary. In some areas this vegetation has even been allowed to overtake monuments in the cemetery. This area requires careful cleaning as part of the erecting of a boundary fence and better screening vegetation (one choice would be the use of Leyland cypress, *Cupressocyparis leylandii*).

We also observed relatively little vegetation invading plots or fences such as is common in City Cemetery.

What we did observe were numerous trees with vines, including poison ivy. These plants must be cut down to the ground and the stumps pained with a full-strength herbicide such as Round-up, Garlon, or Tordon to prevent their return.

Turf and Mowing

The turf at Rest Haven is almost identical to that found at City Cemetery. While there are areas with both Bermuda and fescue, much of the turf consists of broadleaf weeds.

The City reports the use of a granular preemergent herbicide in the Spring at the rate of 5 pounds per 1,000 square feet. Although this

Figure 54. Turf problems at Rest Haven Cemetery. Upper left shows primarily broadleaf weeds. Upper right shows much bare ground in a shady area that would be suitable for mulch. Bottom left shows a displaced monument being covered by soil and grass. Bottom right shows extensive mole damage which seems worse at Rest Haven than City Cemetery.

treatment may have been applied only once or twice with the Parks Department taking over maintenance, it does not appear to have had much of an impact. It may be appropriate to combine the effort with one or more postemergent applications. An excellent guide for Tennessee is available at http://www.tennesseeturfgrassweeds.org/admin/Lists/Fact%20Sheets/Attachments/12/PB1789_editedJan2011.pdf.

Mowing at Rest Haven Cemetery is conducted primarily by two mowers, a John Deere 60-inch zero turn mower and an Exmark stand-on mower with a 36-inch deck.

These represent very large deck mowers to be used in historic cemeteries and even a zero turn mower can prove difficult to operate among closely spaced monuments.

Stones and coping (which are more abundant in Rest Haven than in City Cemetery) clearly reveal the damage that can be done by large equipment combined with less than perfect handling (Figure 55). In other cases we observed large stones being displaced and even shifted off their foundations by mower impacts.

Regardless, we recommend limiting large deck mowers to only the large open areas in the northern half of the cemetery and convert mowing in the remainder of the cemetery to walk behind mowers with decks no larger than 21-inches. These are much less likely to cause damage and

Figure 55. Mowing damage in Rest Haven Cemetery. Upper left shows a footstone repeatedly run over by mowers fragmenting and destroying the top. Upper right shows coping repeatedly impacted by mowers running over it. Middle left shows a bronze lawn marker damaged by a mower. Middle right shows a monument scraped by a mower. Bottom left shows both mower impacts and mower scrapes on a toppled monument. Bottom right shows a lawn marker displaced by mower impacts.

Figure 56. Grave depressions in a lot.

are far easier to maneuver over coping without damaging either the cemetery feature or the mower.

As previously discussed, the proper mowing height for Bermuda and fescue depends on current weather conditions. In cool and humid weather conditions, tall fescue is typically cut to a height of 2 to 3-inches and Bermuda is cut to a height of 1 to 2-inches. During hot and dry conditions, when grasses are under stress, it is appropriate to raise the cutting height, with fescue cut to 2½ to 3½-inches and Bermuda cut to 1¾ to 3 inches. Research reveals that grasses maintained at higher mowing heights have deeper root systems and improved drought tolerance. In addition, raising the mowing height of warm-season grasses as fall approaches will help the grass better over-winter.

It is good practice to increase the mowing height for grass growing in the shade. This allows for more leaf area to intercept as much available light as possible. In addition, leaf blades in shaded areas will be longer and narrower and a lower cutting height will cause an excessive reduction in leaf length.

At Rest Haven Cemetery a good cutting height compromise ranges from 2-inches in cool weather to 3 inches in warm weather (the bulk of the growing season). It is also essential that blades be sharp to ensure that mowing cuts grass blades rather than tearing them.

Mowing is conducted every week during the roughly 10 month growing season. The frequency of mowing is at least partially the result of the abundance of broadleaf weeds that grow more quickly than either the Bermuda or fescue, making the grass look ragged.

There were a few areas where we observed scalping. Many of these areas are the result of large deck mowers being used where there are many sunken graves, resulting in uneven ground surfaces. Scalping causes severe visual damage. More importantly, scalping shocks the

Figure 57. Examples of nylon string trimmer damage at Rest Haven Cemetery.

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 addition to mowing, nylon trimmers are used around monuments, coping, fencing, and plantings. This 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 (Figure 57).

We observed two line weights being used. One was a round line 0.080 inches in diameter. The other is a line with four edges, intended to provide greater cutting power. This line is 0.105 inches in diameter.

Lines this thick can cause extensive, and unnecessary, damage to stones. We recommend a line diameter no greater than 0.065-inch. If the trimmers being used cannot accept line with this diameter, then the lightest weight line possible should be used.

In addition to carefully training staff on proper mowing and trimming, there are several additional steps that can be taken to minimize problems.

We recommend that the edges and sides of each mower be painted a different color. This will transfer when stones are hit and it will be possible to determine who caused the damage.

A second step that can be taken is to install closed cell foam pad attached to the sides and front edges. This bumper will help to minimize accidental damage and its damage will also provide evidence of impacts.

Finally, a problem noted in City Cemetery is the tendency of staff to drive over monuments. This is not only a hazardous practice and disrespectful, but it can cause extensive damage to monuments. We observed several in Rest Haven that had been "scalped" with extensive damage to the monument. The City must establish a clear rule that no monuments in the cemetery should be mowed over.

We were informed that all grass clippings were blown off stones and this is certainly the expected practice. It demonstrates pride in work, attention to detail, and respect for the monuments and families.

Throughout the cemetery we observed bare spots. These areas require renovation as discussed below.

Irrigation

Although Rest Haven Cemetery does not have an irrigation system, and we do not recommend the installation of one, it also lacks working hose bibs. We did observe one historic bib, suggesting that at some point the cemetery had water.

This absence of readily accessible water in the cemetery poses a variety of problems. It severely limits the potential for landscape modifications, new plantings, and irrigation of stressed areas. It limits the ability to clean stones. Families must bring water to their plots for flowers and plants.

Consequently we recommend that several water bibs be installed. With only two bibs being installed – one at each of the existing entrances (south and east), most parts of the cemetery could be reached with no more than 200 feet of hose. Each of these lines could be laid from existing street lines with no disturbance to the cemetery walls or any graves.

We recommend the use of Woodward sanitary hydrants, which would provide back flow prevention, frost proofing to a depth of 2-3 feet, and would allow hoses to remain on during the winter and still prevent freezing. Although more expensive than conventional hydrants, these would eliminate the need for winterizing the system.

Renovation

We recommend that the cemetery implement a renovation program in order to establish a good stand of a single grass type. This work can be accomplished section by section, gradually implementing the efforts throughout the cemetery.

The City has expressed a preference for fescue, which we readily understand and support. Bermuda is somewhat more complex to maintain, requiring more fertilization, thatch control, and more frequent mowing. Bermuda also tends to look significantly better if mowed with a reel-type mower. As a result, a fescue turf is likely a better choice should there be efforts to renovate the turf. We recommend that the use of fescue be coupled with mulching under trees and shady areas where almost no grass will grow. There are a variety of fescue options (https://utextension.tennessee.edu/publications/Documents/W159-E.pdf), although a tall fescue blend would be our recommendation. The City probably has a preferred seed and we endorse using what is known and has been found effective in the past.

Tennessee lacks a good overview of the renovation process. The publication *Lawns in Georgia* (http://extension.uga.edu/publications/files/pdf/B%20773_2.PDF) provides information on renovation of existing turfgrass areas.

Other Landscape Issues

Leaves

It appears that the City is doing a good job dealing with leaves since we observed no piles of leaves at wall corners or in other difficult to reach areas of the cemetery.

There are numerous methods of dealing with leaves, although perhaps the most effective is to blow the leaves away from markers, then mulch them with riding mowers. If the appropriate mulching blades are used, the resulting mulch is sufficiently fine that there is no need to gather any of the debris – everything is simply mulched back into the soil.

Graveled Plots

None of the plots at either City or Rest Haven cemetery have been covered with gravel and this is good. Sometimes lot owners replace grass with gravel, thinking that it will reduce maintenance. Unfortunately this is rarely the case. In fact, these graveled lots almost always present a variety of long-term maintenance problems and the practice is not historically appropriate. The City should prohibit this practice should the issue come up in the future.

Sinking and Collapsing Graves

Both City and Rest Haven cemeteries have a number of sinking or collapsing graves. These depressions mark grave locations and they should not be filled until such time that all depressions have been accurately mapped. After that is accomplished, backfilling them with clean sand and seeding will reduce mowing difficulty and improve general pedestrian safety.

Recommendations

General Issues

- The City should establish a dedicated cemetery maintenance staff with a Cemetery Landscape Manager and two Cemetery Landscape Technicians.

- Landscape technician activities require a great deal of oversight and the Cemetery Landscape Manager should be on-site during all maintenance activities.

- The Cemetery Landscape Manager should make monthly written reports to the City regarding activities and conditions at City and Rest Haven cemeteries.

- The Cemetery Landscape Manager must exhibit interest in continuing education. We recommend membership in landcare organizations such as PLANET or other similar groups, in addition to the

Professional Grounds Maintenance Society.

- The City should not only provide educational opportunities to its employees to become certified in landscape areas, but must insist on continuing education as a condition of continuing employment.

- The City should establish an employee code of conduct that focuses on the specific needs of cemetery work.

- Soil tests reveal that many plant nutrients are being affected by the low soil pH and we recommend that the Cemetery grounds be limed with dolomitic lime, broadcast prior to a rainfall.

- Additional soil tests should be conducted in 2015, after liming, to determine if additional treatments or fertilization are needed.

- 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. We have provided a list of ISA Certified Arborists for the Trustees to use.

- All trees in the cemeteries must be pruned to remove dead wood at no greater than five year intervals.

- All trees must be inspected by an ISA Certified Arborist on a yearly basis and after any significant wind storm.

- The City should prohibit the creation of graveled plots.

City Cemetery

- The pecan tree should be inspected by a certified arborist since it exhibits several problems and may require specific treatment to ensure its continued health.

- The pecan tree requires pruning to remove dead wood and to raise the crown.

- Trees to be planted on cemetery grounds must be carefully identified to be historically appropriate and to avoid significant issues such as surface roots, excessive litter, or weak structure. A list of potential plantings is provided.

- Every tree removed should be replaced by a new tree. It is also appropriate to plant replacement trees in anticipation of their need.

- All replacement trees or new plantings should be 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). All nursery stock should be carefully inspected prior to acceptance and planting.

- All new plantings should have water bags and rigid tree guards installed.

- Older, mature trees in the cemetery – such as the pecan – should have turf removed from under their drip lines and 3-inches of mulch installed.

- All weedy plants and vines must be removed from cemetery shrubs. These shrubs must be inspected on at least a yearly basis to ensure they remain clear of intrusive vegetation.

- Weedy plants and vines must also be removed from around stones and within box tombs. An herbicide should be applied to cut stumps to eliminate new sprouts.

- The cemetery turf exhibits extensive weed invasion. The City should institute a weed control program, using

preemergent and postemergent herbicides.

- The use of large deck mowers in City Cemetery is problematical and only 21-inch walk behind mowers should be used in the western half of the cemetery.

- Many stones in the cemetery are being needlessly damaged by the use of mowers that are too large. These problems are exacerbated by a lack of adequate supervision.

- All mowers must have closed cell foam bumpers installed. These must be replaced as needed. Operators with excessive wear on the bumpers should be given remedial training and instruction.

- Mowing must be conducted with sufficient frequency to maintain turf at a height of about 2-inches in cool weather and 3-inches during the growing season.

- Scalping of the grass must be prevented by more careful grave filling and seeding after all graves have been mapped.

- The line weight used on trimmers is too heavy. We recommend a line no greater than 0.065-inch.

- Grass clippings should continue to be blown off all monuments after every mowing or trimming.

- The Cemetery requires the installation of hose bibs at the three entrances both for landscape maintenance and also stone cleaning.

- Lawn renovation should be undertaken to promote a pure stand of fescue.

Rest Haven Cemetery

- The magnolia tree at the east edge of the cemetery should be inspected by a certified arborist since it exhibits several problems and may require removal.

- Many trees requires pruning to remove dead wood and improve their health.

- Trees to be planted on cemetery grounds must be carefully identified to be historically appropriate and to avoid significant issues such as surface roots, excessive litter, or weak structure. A list of potential plantings is provided.

- Every tree removed should be replaced by a new tree. It is also appropriate to plant replacement trees in anticipation of their need.

- All trees removed should have their stumps cut flush with the ground. Stump grinders should not be used.

- All replacement trees or new plantings should be 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). All nursery stock should be carefully inspected prior to acceptance and planting.

- All new plantings should have water bags and rigid tree guards installed.

- Older, mature trees in the cemetery should have turf removed from under their drip lines and 3-inches of mulch installed.

- Weedy plants and vines must be removed from trees, around stones, and from fences. An herbicide should be applied to cut stumps to eliminate new sprouts.

- The cemetery turf exhibits extensive weed invasion. The City should institute a weed control program, using pre-emergent and postemergent herbicides.

- The use of large deck mowers in Rest Haven Cemetery is problematical and only 21-inch walk behind mowers should be used in the southern half of the cemetery.

- Many stones in the cemetery are being needlessly damaged by the use of mowers that are too large. These problems are exacerbated by a lack of adequate supervision.

- All mowers must have closed cell foam bumpers installed. These must be replaced as needed. Operators with excessive wear on the bumpers should be given remedial training and instruction.

- Mowing must be conducted with sufficient frequency to maintain turf at a height of about 2-inches in cool weather and 3-inches during the growing season.

- Scalping of the grass must be prevented by more careful grave filling and seeding after all graves have been mapped.

- The line weight used on trimmers is too heavy. We recommend a line no greater than 0.065-inch.

- Grass clippings should continue to be blown off all monuments after every mowing or trimming.

- The Cemetery requires the installation of hose bibs at the two entrances both for landscape maintenance and also stone cleaning.

- Lawn renovation should be undertaken to promote a pure stand of fescue.

Other Maintenance Issues

This section briefly explores other cemetery maintenance concerns exclusive of the landscape. We will briefly discuss signage issues, trash, flowers and grave decorations, and policies dealing with orphan stones.

Signage

At the present time City and Rest Haven cemeteries do not have effective signage. It is scattered, not available at each entrance, and is all different with no unifying theme.

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., listed on the National Register).

Regulatory signage specifies laws, regulations, or expected standards of behavior.

The last two types of signage are informational (for example, directional signs) and interpretative (information on historic people buried in the cemetery). While these are excellent and improve the visitor experience, they are not recommended at this point, but may be added in the future.

The City must strive to develop effective and well-designed signage. Signage should combine good and consistent design, and meet the needs of visitors.

Specifically, the signage should provide consistent information; should be universally accessible; viewable by several people at once; and be very durable and able to withstand abuse or constant touching. Signage should be located near entrances and at major circulation intersections.

If the City currently has standardized signage, this should be used, so long as it is not too industrial looking (i.e., as though it came from the sign department of a highway agency).

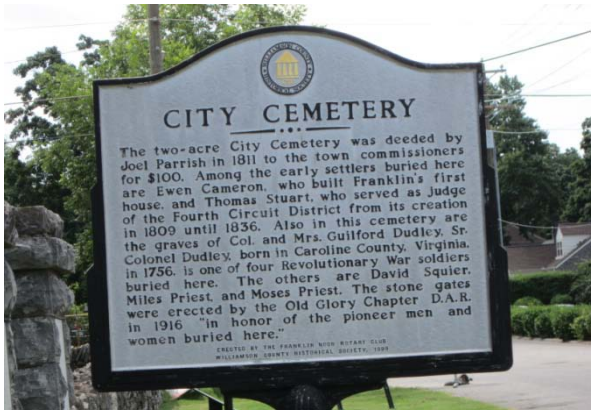
Identification Signage

The current identification signs consist of the standard Tennessee Historical Markers for the two cemeteries (Figure 58). The one for City Cemetery is erected at its western entrance and the one for Rest Haven Cemetery is placed at its eastern entrance. In addition, the cemetery names are on the columns at each entrance, although these are likely often overlooked. There is no identification signage at the other entrances for either cemetery.

We proposed a new sign in classic black with rich gold lettering using a contemporary, but easily read typeface (Figure 59). The new sign should be located outside each entrance, pointing the way into the cemetery and beckoning visitors.

Regulatory Signage

There is no regulatory signage of any description. This signage is critical and should be located at each entrance, so visitors, no matter how they enter the cemeteries, will be clearly informed concerning correct behavior. The signage should be erected parallel to the road, making it readable not only to those entering through the gates, but also those driving by and perhaps preparing to park.



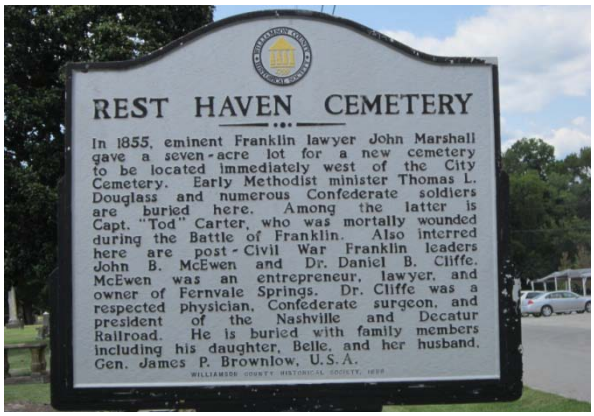


Figure 58. Examples of existing signage. Upper right shows the west entrance to City Cemetery with the historical marker, two marble plaques on the gate columns, and two tour signs. The upper right shows the historical marker. Middle left shows the walking tour sign, with a date different from other documents and the cell phone tour sign. Middle right shows the east entrance to Rest Haven Cemetery with the historical marker, cell phone tour sign, and several additional numbered signs. Lower left shows the historical marker. Lower right shows two numbered tour stops that are today obsolete.

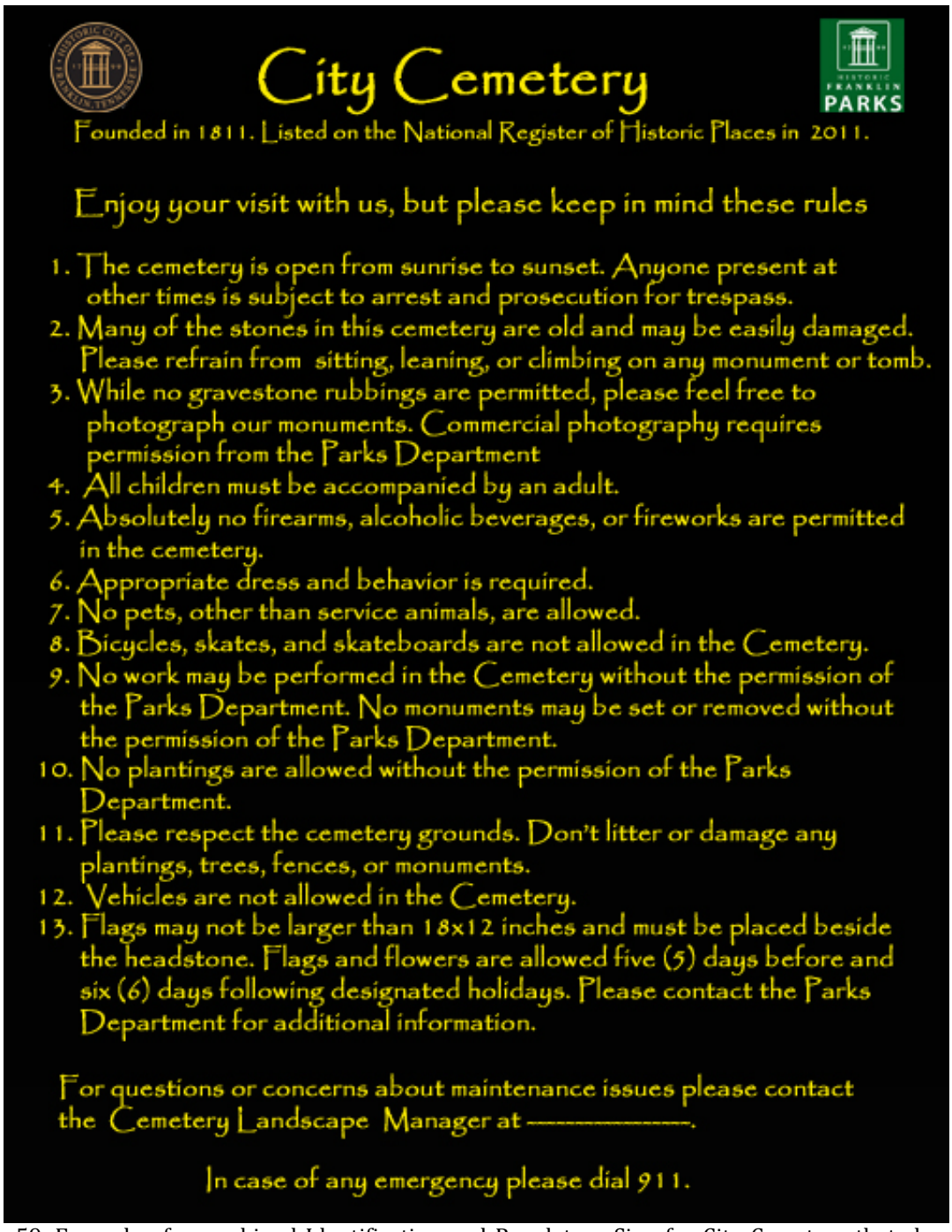


Figure 59. Example of a combined Identification and Regulatory Sign for City Cemetery that should be erected at all entrances. The sign for Rest Haven Cemetery would be identical with the exception that the heading and second line should be adjusted.

Informational Signage

Given the relatively small size of both cemeteries, informational signage (i.e., directions or maps) seems unnecessary and would only clutter the entrances. A simple tour brochure might be useful, but this is a relatively low priority given the numerous significant issues facing the City.

Interpretative Signage

Both cemeteries currently have historical markers at their main entrances on North Margin Street. These signs provide brief historical accounts and should be sufficient for the foreseeable future.

The cell phone tour stops also provide access to additional historical and interpretative information.

Other Signage

Both cemeteries include additional signage for walking tours that we understand is obsolete. Although these tours may be reactivated in the future, we encourage the removal of these signs. They clutter the entrances and confuse visitors. Moreover, they serve no function, making them appear as yet one more example of the lack of care the cemeteries have received over time.

Once you enter Rest Haven Cemetery there are several upright bronze signs that have been placed by various groups promoting historical figures. We have previously observed how these distract from the cemetery landscape and should either be removed or, minimally, mounted as flush to ground markers.

The Parks Department's proposed regulation prohibiting the future erection of markers should be carefully policed. Signage can clutter a cemetery, disturbing its solemnity. Thus, it becomes critical that signage not make the cemetery look cluttered or garish.

Flowers and Other Grave Decorations

As historic cemeteries, neither cemetery seems to have many flowers placed on graves, although the practice may be more common during holidays.

Regardless, the only regulations established by the Parks Department involve flags. These limit the size and establish the holidays when flags may be displayed and for the length of time before and after the holiday.

We recommend that the City adopt a flower policy that will minimize maintenance problems. Extending the flag policy to also include floral arrangements would be simple procedure that should cover most issues.

We observed no grave decorations at either cemetery. Many cemeteries, however, are beginning to 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 in an effort to limit this practice. 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. And additional cemeteries prohibit objects that tend to increase maintenance efforts, such as bird feeders, statuary, and concrete pots.

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 beginning to appear on graves. The City should revisit this issue yearly to determine if a need for action exists.

Trash

While trash is not as significant a problem at City and Rest Haven cemeteries as it is in many municipal cemeteries, we did observe trash in a variety of locations, including on the stone walls.

Given the age of some trash, it appears that it has been in the cemeteries for a very long time. This means that repeated mowings have occurred and staff has not picked this trash up.

This may suggests a lack of supervision. It does not appear that staff is taking the time to carefully inspect the cemeteries for trash; instead, it seems that mowing may be rushed in an effort to get on to the next project. This is yet another reason we recommend a dedicated staff for the maintenance of the cemeteries. Regardless, it is critical that all trash be quickly identified and removed.

The only trash containers are those at the front entrances (on North Margin Street) of the two cemeteries. These are discrete containers that nicely blend with the cemetery. Since these are major entrances, their locations should be sufficient at least until Bicentennial Park becomes more visited. Then it may be prudent to install an additional trash container at the east entrance to City Cemetery and at the north entrance to Rest Haven.

Lost and Orphan Objects

Every cemetery has stones that are no longer associated with their grave. Good management requires that these stones be documented, collected and an effort made to return them to their proper locations. Long-term storage or simply ignoring them is inappropriate.

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

We observed a variety of orphan objects at both City Cemetery and Rest Haven Cemetery. These include stones scattered across the landscape with no obvious grave association.

Many stones have fallen and over time have been covered by soil or grass. Others have been removed from graves and stacked against trees or on top of coping. Others appear to have been little more than flung or dumped against walls. Rest Haven Cemetery even exhibits a variety of fence parts stacked (or dumped?) against the stone wall.

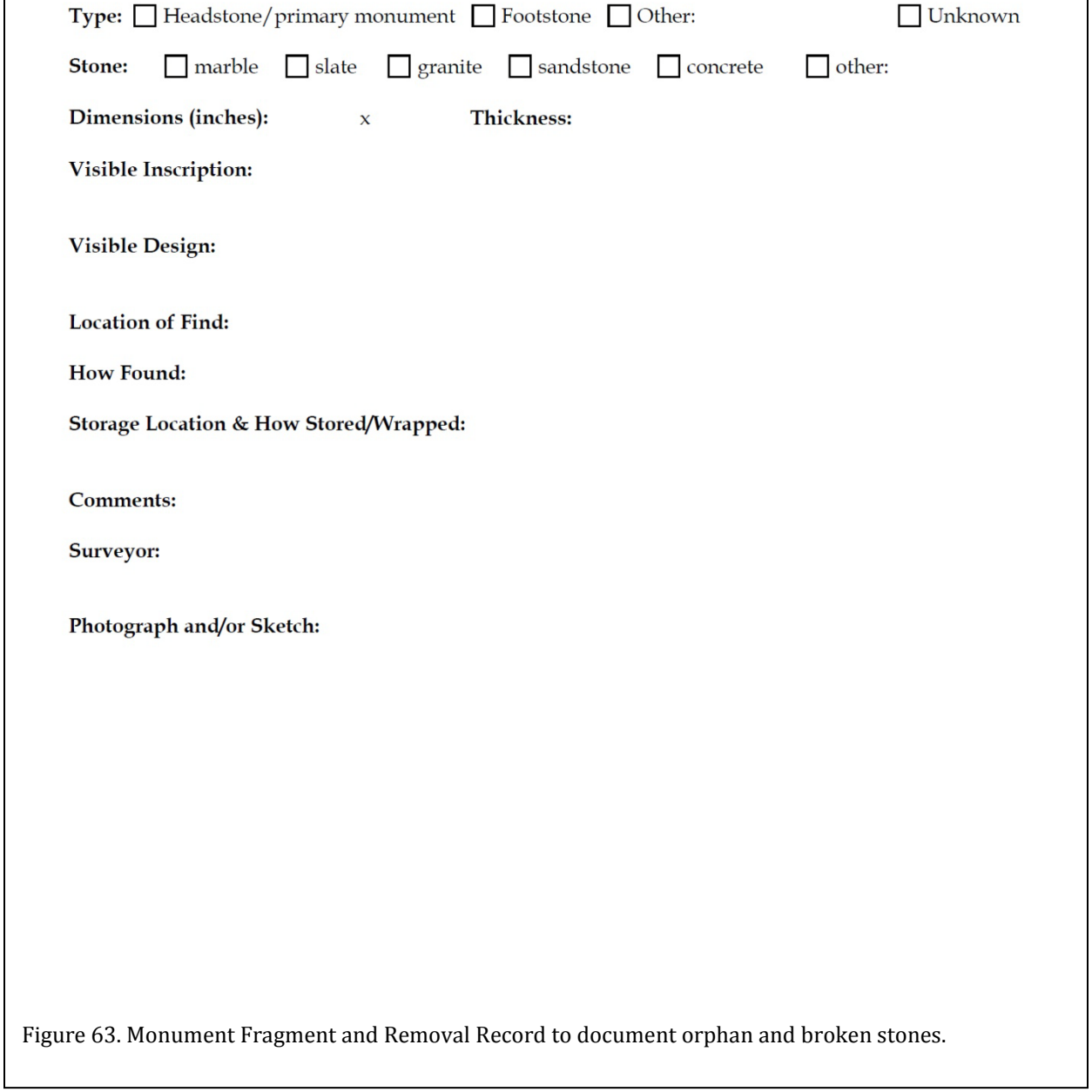
The extent of removals appears tied to the poor maintenance the cemeteries have received. Rather than mow around foot stones, it seems that many were intentionally removed. The problem is especially bad in Rest Haven Cemetery.

Unsecured, these fence parts and even stones beckon both vandals and thieves. When cemetery artifacts appear uncared for, it increases the temptation for the public to take souvenirs home with them.

Figure 60. Trash in City and Rest Haven cemeteries. Upper left shows trash on the stone walls, present in both cemeteries. Upper right shows trash along northern boundary of City Cemetery. Middle left shows a sheet of Styrofoam insulation board that has been mowed over in City Cemetery. Middle right shows a piece of roofing metal at the front gate of City Cemetery. Lower left, construction trash on the Rest Haven wall. Lower right, trash on the Rest Haven wall.

Figure 61. Orphan stones in City Cemetery. Upper left shows stones set on a box tomb for so long that stains have been created. Upper right shows stones stacked on plot coping. Middle left shows stone fragments dumped against the boundary wall. Middle right, stones set on plot coping. Lower left, obelisk fragment leaning against another monument. Lower right, stone fragment almost buried in the soil with no obvious grave association.

Figure 62. Orphan stones and fence parts in Rest Haven Cemetery. Upper left, a pile of foot stones stacked on plot coping. Upper right, foot stones tossed on the east stone boundary wall. Middle left, headstones dumped along the boundary wall. Middle right, table tomb legs and other fragments dumped along the boundary wall. Lower left, fence sections dumped against the boundary wall. Lower right, a second pile of fence parts.



Chicora Foundation, Inc.
PO Box 8664
Columbia, SC 29202
803-787-6910

MONUMENT FRAGMENT AND REMOVAL RECORD

Cemetery: **Date:** **Fragment ID#:**

Origin, if known: Grave #: **Section #:** **Lot #:**

Type: ☐ Headstone/primary monument ☐ Footstone ☐ Other: ☐ Unknown

Stone: ☐ marble ☐ slate ☐ granite ☐ sandstone ☐ concrete ☐ other:

Dimensions (inches): x **Thickness:**

Visible Inscription:

Visible Design:

Location of Find:

How Found:

Storage Location & How Stored/Wrapped:

Comments:

Surveyor:

Photograph and/or Sketch:

Figure 63. Monument Fragment and Removal Record to document orphan and broken stones.

A form that can be used to document fragments or orphans is provided as Figure 63. Such a form should be completed for every object found orphaned in the cemetery in preparation for storage.

Until it is possible for repairs to be made, every orphan object should be documented with a photograph and form. The object should be carefully identified using a stainless steel tag (such as available from Forestry Suppliers, http://www.forestry-suppliers.com/product_pages/Products.asp?mi=11821&title=Double-Faced%20Aluminum%20Tags,%203%94%20x%204%94,%20Box%20of%2050&itemnum=79262) and then stored to prevent loss or additional damage. All objects should be stored in one secure location, such as the building at the southwest corner of Rest Haven Cemetery currently being used as a construction office.

Figure 64. Displaced or damaged curbs and copings. Upper photo shows displaced coping in City Cemetery. Lower photo shows broken and badly displaced wall coping at Rest Haven Cemetery.

Plot Curbs or Coping

Plot curbs and coping are considered here since they are of secondary important to the condition of the monument. However, the curbs and coping are in overall poor condition with considerable displacement. Several examples are shown in Figure 64.

Marble, limestone, and granite curbs are sinking or have been displaced. Some concrete curbs, not being reinforced, are broken as the ground sinks under them.

Infilling of depressed areas and resetting of curbs should be a routine maintenance operation. The use of a curb setting tool would be of assistance, but is not essential and the job can be done by hand.

Recommendations

- A sign theme should be developed for the cemeteries using consistent colors and type faces.
- The cemeteries require a combined identification and regulatory sign placed at each entrance. An example of one

possibility has been provided.

- The current roadside historical markers can be left in place, but obsolete signage should be removed.

- The City should establish a flower policy similar to that developed for flags.

- The City should periodically evaluate whether it would be appropriate to establish a policy that allows staff to remove all "temporary objects" on graves or in plots when they become withered, unsightly, or an obstruction to maintenance.

- Staff must be responsible for collecting and disposing of trash prior to mowing.

- The Cemetery will need additional trash containers once Bicentennial Park becomes operational; the two at entrances along North Margin Street will not be sufficient.

- "Orphan" stones should be documented using a form and collected for short-term safe keeping until their appropriate location is identified through research. In so far as possible, stones should not be allowed to become disassociated with their graves as this effectively loses the grave location.

- Plot curbs or coping throughout the cemeteries are in deteriorating condition. The repair of these curbs must be viewed as routine maintenance and must be integrated into the maintenance plan.

Conservation Issues

In the introduction to this plan we briefly discussed a variety of preservation issues, tackling the question of why it is important to preserve sites like City and Rest Haven cemeteries, as well as how preservation and restoration differ, and introducing the reader to the Secretary of Interior's Standards for Preservation. Readers may want to refer back to those discussions since they form a foundation for our discussion of the conservation needs at Franklin's two cemeteries.

Standards for Conservation Work

The City of Franklin is the steward of these cemeteries, holding what belonged to past generations in trust for future generations. As such the Mayor and Aldermen bear a great responsibility for ensuring that no harm comes to the property during their watch.

One way to ensure the long-term preservation of the cemetery is to ensure that all work meets or exceeds the Secretary of the Interior's Standards for Preservation, discussed on pages 6-8 of this study.

Another critical requirement is that Parks Department ensures that any work performed in the cemeteries be conducted by a trained conservator who subscribes to the Guidelines for Practice and Code of Ethics of the American Institute for Conservation of Historic and Artistic Works (AIC) (http://www.nps.gov/training/tel/Guides/HPS1022_AIC_Code_of_Ethics.pdf).

These standards cover such issues as:

- Respect the original fabric and retain as much as possible – don't replace it needlessly.
- Ensure that the treatment chosen is suitable for the object, recognizing that at times no treatment is the best option.
- Choose the gentlest and least invasive methods possible.
- Is the treatment reversible? Is retreatment possible?
- Don't use a chemical without understanding its effect 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 and Guidelines also require 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.

These Guidelines of Practice and Code of Ethics place a much higher standard on AIC conservators than individuals or commercial monument companies that offer "restoration

services." This higher standard, however, helps ensure that City and Rest Haven cemeteries receive the very best possible care and that the treatments conducted are appropriate and safe.

Past Conservation Efforts

Review of the monuments during this assessment revealed that at some point in the past various efforts to repair stones were made. Universally these efforts, while well meaning, were inappropriate and ultimately resulted in additional, unnecessary damage.

These efforts should demonstrate that well-meaning, but otherwise uniformed repair efforts should be avoided – whether undertaken by individuals or the City itself.

We understand and sympathize with efforts to control costs and use staff for as many tasks as possible; however, conservation is more than a trade where, with a few workshops, any individual can be considered competent.

There are many tasks where volunteers and staff, with limited training, can make a significant difference in the long-term preservation of these cemeteries. It is important, however, to realize that untrained individuals with poorly formulated plans can cause extensive damage.

If the City wishes to dedicate staff to the maintenance of City and Rest Haven cemeteries on a full-time basis and take the steps necessary to ensure continuity, then it makes sense to provide the training necessary to expand their abilities to repair stones. The City should realize that stone conservation requires extensive training and a large tool kit. This means that the City must be willing to devote employees to multiple weeks of training in order to develop the necessary skill

	Table Tomb	Box Tomb	Ledger	Headstone	Footstone	Tab in Socket	Die on Base	Pedestal Marker	Obelisk	Others
Unstable	3	15								
Collapsed	3	41						3		
Broken	3	33	10	14		8	2		6	1
Spalling	1	7	4	12	1				3	
Missing Parts		14								
Recarved		2						1		
Displaced			9	30	5	8				19
Set as Headstones			2							
Tilted				7	5					
Fallen							6	2	2	
Loose							1	4	2	
Cracked								2		
Old Repair Failing									2	

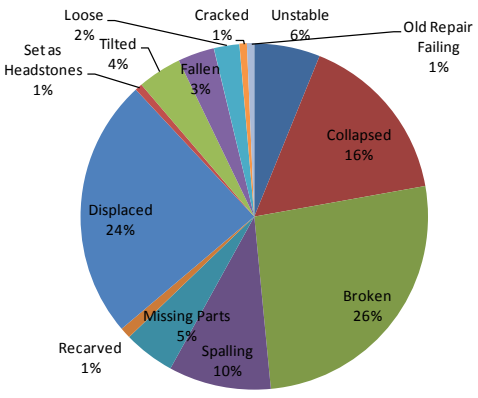


Figure 65. Damaged stones and conservation problems in City Cemetery.

	Table Tomb	Box Tomb	Ledger	Headstone	Footstone	Tab in Socket	Die on Base	Pedestal Marker	Obelisk	Lawn Marker	Cradle Grave	Others
Collapsed		1										
Broken		1	2	16	11	11	5	4			7	
Spalling	1		1	5	2		3	1				
Displaced				13	43	5	4			4		83
Set as Headstones			1									
Tilted/Sinking		1		10	9	7	3	3	2	16	2	
Fallen				1		3	8	3	2			
Loose						19	27	5	3			
Cracked								3				
Old Repair Failing				4		11	5					
Other Damage	1				1	3	8	2	5			

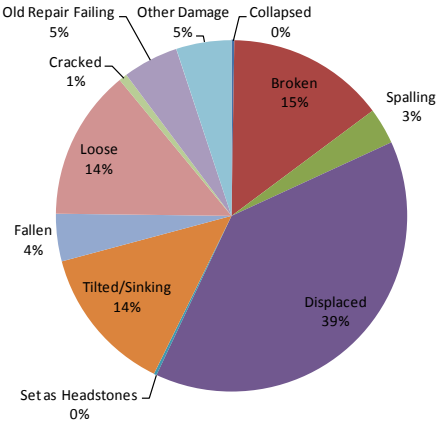


Figure 66. Damaged stones and conservation problems in Rest Haven Cemetery.

sets, plus a significant sum of money to obtain the tools and equipment necessary for monument work.

On the other hand, if the City is not willing to take these steps, then it would be best to anticipate contracting out monument conservation tasks.

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 by the monuments in the two cemeteries. These discussions provide general observations that will help place the recommendations in a broader context.

Figure 65 shows a tabulation of damage in City Cemetery. Nearly 300 stones in this cemetery require repair. With some authors reporting about 370 interments (certainly this must mean marked graves), over 80% of the monuments in the cemetery require intervention.

The most common damage (representing 26% of the tabulations) is breakage, followed by stones that are displaced or moved from their original location to somewhere else in the cemetery. Box and table tombs are in particularly dire condition, with 44 collapsed and 36 broken. Although we identify "only" 14 as missing parts, the way these tombs have been stacked and moved about, this is only an estimate; the number may be much larger.

The condition cannot be thought of as any better at Rest Haven Cemetery (Figure 66). There we understand there are about 475 interments (which we take to mean monuments). Of these, 391 require conservation – representing 82% of the monuments.

At Rest Haven Cemetery the greatest

damage or problem are displaced monuments, representing 39% of those tabulated. An additional 15% of the monuments are broken, another 14% are loose, and 14% are tilted or sinking. There are at least 152 displaced stones in the cemetery, including many that we view as orphans.

The damage at these two cemeteries is unprecedented. We have never seen a cemetery with so much damage. Readers should understand that this damage did not occur in a matter of weeks or months. Rather it reflects decades of inattention. Consequently, it is important to understand that the repair of these problems will require much effort and a very large budget – whether done by a professional conservator, City employees, or volunteers.

Displaced Monuments

The most significant problem at Rest Haven Cemetery and a major problem at City Cemetery are the stones characterized as displaced. A great many of these are orphan stones, which have been discussed in the previous section. This discussion will serve as a reminder that it is critical to collect and protect these orphan stones until conservation efforts are able to determine where they should be reset.

Some of the displaced monuments have been dislocated by aggressive mowing practices. These can be immediately reset as described below.

The prevalence of this problem documents the need for a much more careful maintenance program that will ensure stones are protected and preserved.

Figures 62 and 64 can be reviewed for examples of displaced monuments. Figure 63 is a form we recommend using as these are collected in order to provide complete documentation.

Sinking and Tilted Monuments

Monuments tend to sink or tilt because they were originally set without an adequate foundation on the grave shaft. As a result, as the grave collapsed inward, the monument followed. Of course, some tilting occurs because of maintenance impacts as well.

This is a significant, long-term problem for the Cemetery since as stones sink they become more likely to topple. As they topple not only is the appearance of the Cemetery dramatically altered, but the monuments can present a significant liability to the City. In addition, as monuments topple they are very likely to hit coping, walls, or other stones, causing damage to themselves or the objects they hit. This dramatically increases repair costs.

The solution involves the resetting of these monuments, prior to their further collapse.

Simple Resetting

A large number of stones in the cemetery require resetting. Some of these are flush-to-ground lawn markers or tablets that have sunk and are now either tilted or being covered with soil and grass. Others have fallen and are being covered by soil and grass. Resetting is generally simple and a suitable task for volunteers.

The stone should be excavated, being careful to avoid shovel damage. If the monument has been set in concrete, the removal of this material may require a conservator to ensure that the stone itself isn't damaged. Otherwise, the hole can be deepened and filled with pea gravel or decomposed granite as bedding. The lawn marker should be reset about 1 inch above the ground level – tall enough to prevent being covered by soil and grass, but not so tall that it will be damaged by mowing. Tablets should be set with about 25 to 33% of the stone below grade. Additional pea gravel should be packed in around the stone as it is being leveled. The upper inch of backfill should be soil to allow for revegetation.

Figure 67. Examples of stones requiring resetting. Upper left, die on base that has collapsed. Upper right, tilted footstone. Middle left, tilted footstone. Middle right, sunken granite footstone being damaged by mowing. Lower left, toppled obelisk that requires resetting. This monument will require lifting equipment and rigging. The bases must first be leveled, and the bases and obelisk shaft drilled for the installation of a stainless steel pin. Bottom right, tilted headstone that requires resetting.

It is critical that Portland cement never be used to reset stones since it removes their ability to shift if they are accidently hit by mowing or other landscape activities.

Resetting Die on Base Stones

All cemeteries have a number of granite or marble die on base stones that were originally set using setting compound. This is a commercial product typically consisting of calcium carbonate, talc, and occasionally calcium silicate in linseed oil or a similar material. It is designed to be applied under a granite monument to help seal it to base and prevent water intrusion. Because it contains oil it may leave a halo on marble and should only be used for setting granite monuments. Setting compound is not an adhesive and will eventually dry out. It also does not prevent a monument from being tipped over, so care must be taken when the monument being set is top heavy, very tall, or is in a setting where vandalism is likely. In such cases it is good practice to set the monument not only with setting compound, but also with one or more fiberglass pins.

Marble stones were typically set with a mortar rather than setting compound, although this too is not an adhesive and will often fail.

In order to reset a die on base that is loose or shifted, it is first necessary to remove the die and set it aside. The base then must be checked to determine if it is both stable and level. In many cases it will be necessary to remove the base, establish a new foundation with pea gravel or decomposed granite.

All old mortar or setting compound must be removed from the base and the die. This can usually be accomplished using plastic spatulas or a small chisel. Care must be taken not to disfigure the stone during this cleaning process.

If pins are to be installed holes must be drilled and cleaned in both the die and base. Either fiberglass or stainless steel pins should be inserted that are slightly shorter and smaller than the holes. While they may be set using epoxy or lime mortar, it is often acceptable to leave them loose.

The purpose of these pins is to help secure the base and die, making it more difficult to accidently (or intentionally) tip a monument over.

If setting compound is being used on granite markers, it should be rolled between your hands to create “strings” 1-2 feet in length and about ½ inch in diameter. These strings should be set about ½ inch inside the edge of where the die will make contact with the base. Poly cushion spaces should be used at the four corners to prevent the setting compound from being expelled when the die is reset.

If the monument is marble, then a lime based mortar (never Portland cement mortar) should be used rather than setting compound. Setting cushions should be used to ensure that the mortar is not forced out by the heavy die.

The stone is then reset and appropriately centered – there are special monument setting devices to assist in this. Setting compound that is pushed out can be cut off using a plastic spatula for later reuse. Excess mortar can be manually removed and then the monument can be cleaned off using a barely damp sponge and fresh water. If there are any gaps, additional setting compound or mortar will need to be used to fill these gaps.

At times the dies were originally set using ferrous pins. This further complicates resetting since these ferrous pins must be removed and replaced with either fiberglass or stainless steel.

Cradle Graves

Cradle graves, also called bedstead monuments, are combinations of headstones and footstones connected by side rails, giving the appearance of a bed. Historically these were often planted in flowers or groundcover.

Resetting cradle graves is more difficult and time consuming then other monument types, but involves essentially the same techniques. The

Figure 68. Examples of die on base and cradle grave damage. Upper left shows a die on base. Still present are two ferrous pins in the die which must be replaced with fiberglass or stainless steel pins prior to resetting. Upper right is a die on base that because of its height will require pinning. Middle left shows a modern granite die on base that has shifted significantly and requires resetting. Middle right shows a toppled die on base that requires leveling and pinning as part of resetting. Lower photos show cradle graves that require resetting and repair.

individual parts were typically connected by ferrous or brass pins. These fail as the grave shaft collapses and individual components begin sinking or tilting. Sometimes the side rails are unable to take the stress and break, further complicating resetting efforts.

The first step is removal of the individual components and infilling the grave with decomposed granite in order to establish a good foundation for rebuilding the monument. If all of the parts are intact, they are simply reset as described in the above sections.

If the side rails are broken, which is unfortunately common once they are exposed, then the monument requires conservation treatment. The side rails must be drilled and fiberglass pins installed to link the broken fragments. Further information is provided in the discussion on repair of broken monuments.

Loose Monuments

There are a number of loose monuments throughout the two cemeteries. These are typically die on base markers where the monument company failed to insert a pin to stabilize the two parts (the die and the base). These monuments remain upright through gravity and consequently pose a significant threat to the public, other monuments, and themselves.

For such monuments we recommend drilling and pining as described earlier to improve stability and reduce the City's liability.

Large Monuments

There are, unfortunately, some large monuments that are severely tilted or fallen. Depending on their size, these will require the use of a tripod, small equipment, or even a crane to facilitate resetting. These should be reset by a conservator trained in rigging and using the equipment needed for large, heavy monuments.

Tab in Socket Monuments

These are monuments where the base has a recess or socket into which a tab on the die fits, joining the base and die. Tab in socket stones were originally set with a high lime mortar. Over time these may come loose and require resetting.

Resetting correctly is very simple, but too often past repair efforts have used Portland cement mortar, which is very hard and inflexible. If the stone received any impacts after such a repair the tab is almost certain to break off in the socket, requiring a much more complex repair involving pinning, described below.

If still in good condition, however, resetting can be relatively simple. The socket must be cleaned of loose mortar and releveled using pea gravel or decomposed granite. Then the stone should be reset using a soft mortar such as a 1:2.5 mix of NHL 3.5 and sand. It is always important that the mortar used be soft – should the stone be impacted, we want the mortar to fail, not the stone. Afterwards, the stone is braced for 48 hours to allow the mortar to set.

Broken Stones

There are at least 77 broken monuments at City Cemetery and at least an additional 57 at Rest Haven. Leaving these stones laying on the ground or leaning against other stones subjects them to additional damage, increasing the eventual cost of appropriate repair. Stones on the ground are walked on, may have mowers run over them, and if they are marble or limestone, are subject to greater acid rain damage. It is always critical to erect fallen stones and this simple resetting is an activity that volunteers could undertake.

Adding to the problem there are many stones that have been improperly repaired, using poor materials and techniques. It is always far easier to conduct an appropriate conservation treatment than to "undo" inappropriate actions, such as simple epoxy repairs or the use of ferrous pins. The use of "simple epoxy" repairs – where

Figure 69. Examples of tab in socket stones. Upper photo shows a stone entirely out its socket. Lower photo shows a stone with a tab loose in its socket.

stone fragments are joined using a continuous bead of epoxy are inappropriate. 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. The use of ferrous pins will be discussed below.

Appropriate conservation treatment requires a blind pin repair. This drilling and pinning is a process that involves carefully aligning the fragments, drilling the stones, and setting fiberglass, or occasionally threaded 316 stainless steel rod, using a structural epoxy in the drill holes.

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. The choice of epoxy depends on the required strength, among other factors.

Since there is also usually some loss of fabric along the break, this treatment will also involve infilling areas of loss with a compatible mortar. This consists of 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.

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 materials include 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 if necessary.

Drilling stones is a complex treatment that should only be conducted by a trained conservator. Infill is similarly complex and the Jahn products require certification in their use

Figure 70. Examples of broken stones. Upper left shows a die on two bases. When the stone fell or was pushed over, the impact of hitting the ground caused the die to break. Upper right shows a badly broken marble ledger. Middle left shows a tab in socket with the die broken and use of ferrous pins in a failed repair. Middle right shows a broken tab in socket. Lower left shows a headstone and use of ferrous pins in a failed repair. Lower right shows a failed simple epoxy repair.

through Cathedral Stone.

Ferrous Pins

City and Rest Haven cemeteries exhibit a number of die on base stones joined using ferrous pins. In other cases old repairs were made using ferrous pins. In one case join fragments were joined using iron bars and ferrous bolts.

These stones should be given a high treatment priority since, left untreated, the corrosion of the ferrous pins will cause significant spalling, cracking, and breakage of the stones – a process known as "iron jacking." The corrosion products of these ferrous pins have a greater volume than the original pin and as the corrosion products expand, they crack the stone. Many of these stones already exhibit corrosion staining and cracking.

It is necessary to use diamond core drills to remove the corroded ferrous pins and replace them with either fiberglass or, rarely, stainless steel. Afterwards it is necessary to fill the voids with a natural cementitious composite stone material such as that previously described for infill repairs.

In some cases the iron pins have already caused the stone to spall. Treatment is similar, except that the replacement pins must often be longer and inserted into stone that is still capable of bearing the weight of the monument. Such repairs also necessitate major reproduction of lost stone and therefore are more time consuming and expensive.

Box and Table Tomb Problems

City Cemetery reveals a special problem related to box and table tombs. These range from instability, partial or total collapse, breaks, and incorrect setting of box tomb ledgers as headstones.

Box and Table tombs are among the oldest stone types and represent great artistry. Unfortunately, they have been so poorly maintained by the City that they serve to significantly devalue the cemetery landscape. Consequently it is especially important that conservation efforts be devoted to these monuments.

Given the range of problems and the extent of damage, it is difficult to provide even basic recommendations. Essentially each monument will require a treatment plan to be developed specifically for that tomb.

Where all of the parts of box tombs are present, consisting of a base, two end panels, two side panels, often (but not always) four corner posts, and a ledger, reconstruction may be relatively simple.

It is first necessary to relevel the base which provides support to the box itself. This base should be at ground level and set on decomposed granite or pea gravel to promote drainage. If there are corner posts, typically the side and end panels slide into slots. Without corner posts, usually either the side or end panels are notched to allow the parts to join. Often ferrous dogs or clamps were used to attach the different parts. These should be discarded and either stainless steel or naval brass dogs used instead. The use of different dogs may require redrilling the holes.

At times an internal armature is necessary to hold the side panels and prevent their movement.

Once the box is reset, the ledger should be set on a high lime mortar, such as a 1:2.5 mix of NHL 3.5 and sand.

Broken panels may be drilled and pinned, and still be self-supporting if the damage is not too bad. Sometimes, however, and internal brick or CMU armature is necessary to help support the repairs. If the ledger is broken, it may be necessary to use a new marble ledger to provide support, reassembling the original ledger on the new marble support.

Table tombs are similar, consisting of a support base, four or six legs, and a ledger. Often

Figure 71. Examples of ferrous pins and iron jacking. Upper left shows a headstone reinforced with iron bars and bolts, all of which are corroding. Upper right shows the die cracking as a result of iron jacking resulting from two ferrous pins. Middle left shows the next phase in the process, with the corners of the die completely shattered by iron jacking. Middle right shows the loss of the middle base (in the grass, foreground) as a result of iron jacking. Lower left shows inappropriate repair using ferrous pins. Lower right shows die on base setting using a ferrous pin.

Figure 72. Box tombs. Upper left shows an ornate example that, while intact, has badly shifted on its base. Without resetting it will collapse and suffer damage. Upper right shows a box tomb that has collapsed, resulting in the breakage of the ledger – dramatically increasing repair costs. Middle left shows a partially collapsed box tomb with both the side walls and ledger broken. This box tomb does not have corner posts. Middle right, a box tomb that is badly damaged, but still standing. It also reveals much vegetation growing out of the box, which will eventually cause even more damage. Lower left shows a collapsed box tomb with its parts neatly stacked. Lower right shows a ferrous dog in a still standing box tomb.

Figure 73. Examples of box and table tombs. Upper left shows a collapsed box tomb. The bottom slab is broken and anyone walking on the supported ledger will cause it to break. Upper right shows a ledger from a box tomb reset as a headstone. Middle left shows a table tomb that, while still standing, is unstable. If it collapses it will likely further break the ledger and possibly one of more of the legs. Middle right shows another unstable table tomb where parts of other monuments have been used in an effort to level the ledger. Lower left shows broken legs from Rest Haven Cemetery dumped along the wall. At that cemetery many of the ledgers were probably originally box or table tombs. Lower right shows one of the few still standing table tombs in Rest Haven Cemetery. In the background are two ledgers that were probably originally table tombs.

some or all of the legs are damaged. The ledger is also often broken.

Once again, repair is not difficult if all of the parts are present and in reasonably good condition. It is often necessary to drill and pins legs to their ground support, as well to the ledger.

Where legs are badly damaged or missing, it is necessary to fabricate new ones. While original designs can typically be replicated by a marble wholesaler, this is not always necessary. It may be appropriate to use a simple square shaft of similar dimensions, clearly indicating to the public a replacement.

Broken ledgers for table tombs are more difficult problems. Repairs rarely provide adequate stability and it is almost always necessary to first set a blank marble ledger on which the original ledger can be pieced back together. Although this slightly changes the three-dimensional appearance of the monument, the ability to stabilize and reset the monument more than justifies this slight modification.

Spalling

We are using this term to cover a variety of problems inherent to sandstone, including blistering and delamination.

It is likely that soluble salts are a leading cause of blistering which consists of rounded blisters forming on the stone. The blisters are hollow, frequently break, and expose friable stone below. Associated with what are known as contour scaling, these may reveal locations of salt concentrations. Generally it is best to leave these blisters alone for as long as possible since this helps maintain the historic fabric. Eventually it may be necessary to remove salts through brushing and the use of poltices. Some conservators also remove the friable stone to solid material and infill the areas of loss.

Delamination is also known as exfoliation and consists of the stone separating along its bedding planes (whether those planes are visible or not). The split sections can be very thin, affecting the stone only near the surface, or they can be several centimeters thick. Its cause is associated with weakening of the bedding planes. The ones lost may be more permeable or may contain more soluble material. These problems allow more water access into some parts of the stone than others. Delamination may be aggravated by setting stones to allow their beds to be exposed to water penetration.

Treatment depends on the extent of damage and whether the bedding plans are accessible. If they are, treatments include the use of injection grout to reattach loose material and seal the cracks to prevent additional water penetration. Where edges cannot be accessed, it become necessary to drill holes to facilitate injection of the grout. Damage may be so extensive that there is little option but to remove the loose material (which will likely be eventually lost) and patch the surface to replicate the original profile and match the cleaned color.

At times these problems may also be addressed by consolidation, process in which the conservator attempts to bind the friable layers back together. Most of these treatments are based on silicic ethyl esters. Their extremely small molecular structure enables them to penetrate deeply into deteriorated stone, collecting at contact points between individual stone grains. An internal catalyst and atmospheric humidity then convert the liquid consolidant into a glass-like silicon dioxide ($Si0_2$) gel which binds the stone particles together.

Cleaning

Many of the stones exhibit relatively dense deposits of lichen (a symbiotic association typically between fungus and green algae). While sometimes viewed as only an aesthetic issue, there are many stones in City and Rest Haven cemeteries where the biologicals have become so thick that the carving on the stone is today illegible. These biologicals may damage stone in a variety of additional ways. As lichen and other plants grow, they can exert pressure on the mineral grains, weakening the intergranular

Figure 74. Spalling. Upper left shows a sandstone side panel of a box tomb with heavy spalling or exfoliation to the point that a large segment has been lost. Upper right shows spalling at the base of a headstone resulting from salts. Left unchecked, the headstone will eventually collapse. Middle left shows a spalling (and broken) ledger. Eventually all of the inscription will be lost. Middle right shows a badly deteriorated base where the bedding planes are clearly visible. Bottom left shows another spalling base that is causing instability in the overhead obelisk. Lower right photo shows a crack developing in a headstone. Left untreated this will cause the carved face to spall off the monument.

Figure 75. Extensive spalling on two sandstone obelisks in City Cemetery.

structure. Some organisms produce acid compounds that dissolve the calcium carbonate. Some can even etch granite. Many of the lichen and algae allow water to migrate into cracks and crevices of the stone, leading to freeze-thaw damage.

While cleaning is often recommended, inappropriate cleaning can result in a significant amount of damage. We observed multiple examples at Franklin's cemeteries where individuals, in an effort to read the stone, have used a coin or other metal object to scrape the surface. This causes damage to the stone surface which often can be removed only by polishing the surface.

Table 14 lists problems with a variety of "common" stone cleaning processes widely used by commercial firms and the public. This information is important to the Parks Department and should also be made available to any families that may inquire about cleaning their specific monuments.

A suitable biocide for cleaning stones is D/2 Biological Solution (http://d2bio.com/) available from a variety of conservation suppliers. Stones should always be prewetted prior to application of D/2 and after dwelling for a few minutes followed by gentle scrubbing, should be flushed from the stone. Figure 76 shows a photograph of the Sarah Rodgers monument in City Cemetery before and after cleaning with D/2. After only 10 minutes a stone that is unreadable because of the accumulations of biologicals is legible and will not require cleaning again for a year or more.

Figure 76. Cleaning issues in the cemeteries. Upper left shows a close-up of lichen on a stone at City Cemetery. Upper right shows a different lichen form at Rest Haven Cemetery. Middle left shows a table tomb harshly cleaned in an effort to read the inscription. Middle right shows an improperly cleaned inscription on an obelisk; the remainder of the monument was left soiled. Bottom shows a stone before and 10 minutes after cleaning with D/2 Biological Solution.

Table 5.
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 15 years.	No special precautions required for use, handling, or storage.

Plot Walls

Only one of the plots, at Rest Haven Cemetery, is surrounded by a wall constructed of limestone blocks measuring about 11 by 20 feet. It is mortared and in generally good condition. There is no opening. No work is required on this wall at the present time.

Plot Fences

Plot fences are found in both cemeteries and are characterized as being in good, fair, or poor condition in Table 6. Fences in good condition are those that, minimally, are painted or have little corrosion and that are structurally stable. Fences listed in fair condition are structural stable, but are missing parts and not painted. Finally, those listed in poor condition are unstable, unpainted, and missing many parts or even entire fence sections.

We have added a fourth category, "missing." These are plots where there is evidence that a fence once existed, but it has been completely removed. While often cemeteries talk of fences being donated during the WWII scrape drives, it seems more common to have fences stolen, especially during periods when the cemetery received little or no care.

Eight of the 17 fences at the two cemeteries (47%) are either in poor condition or have been entirely lost. An additional six fences (35%) are in, at best, fair condition. Only three fences in the two cemeteries can be classified as

Figure 77. Plot wall in Rest Haven Cemetery

being in good condition. While these findings are very troubling, they are sadly consistent with our discovery of the great many monuments that are damaged. Unfortunately, the fences in these two cemeteries were did not receive preventative maintenance. As a result, almost immediate intervention is critical.

Treatments

All fences receiving treatment should first be examined for open joints and other areas where water can penetrate through capillary action. These areas should be carefully caulked with Sikaflex 1a, an elastomeric caulk that is often used in fence repair. Under no circumstance should a silicon caulk be used.

It did not appear that any of the fences exhibit remaining paint. This is a perfect situation for light brushing to remove loose corrosion followed by the application of Rust-Oleum Rust Reformer®. This product has been tested by the Canadian Conservation Institute, including exposure to very harsh salt spray and was one of their top three best performers (it is, today, the only formulation still available). Rust Reformer® is a conversion process that stabilizes the corrosion products and serves as a primer. This product cures to a blue-black color.

It should be top coated with Rust-Oleum High Performance Protective Enamel® in flat white followed by a final top coat of flat black 24 hours later. This is a quality assurance process since any areas missed by the flat white will immediately be identified by the undercoat of black Rust Reformer®. Similarly any areas missed by the application of final top coat of flat black will immediately be recognized by the underlying white paint.

Paint application should be by brush, producing an initial dry coat of 1-2 mils (the wet build-up is typically twice this).

While fences in good condition may require little more than paint as we describe here, the other fences require far greater intervention for their long-term preservation.

Many, but not all, of the fences are sitting on stone coping. Where coping is not present or has sunk, it is critical that fence bottom rails (or other elements) not be allowed to be covered by soil. Prior to any repair or painting it is essential that the ironwork be removed from ground contact. This will usually require re-sculpting or contouring the ground to allow exposure and ensure that water flows away from the fence.

Whenever possible, painting should be by brush. If airless sprayers must be used there will be much overspray, requiring much larger amounts of paint. In addition, all vegetation and all stones within the plot – and all immediately adjacent plots – must be fully wrapped in plastic to prevent damage from drift. The requirement for additional paint and the time required to wrap vegetation and monuments will significantly increase the cost of the work.

Welding is appropriate in some situations, but not all. 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. Where there were originally slip joints, however, welding is inappropriate since it will create stresses that can cause additional damage. For these areas it is necessary to infill the fabric and recreate slip joints that allow movement.

Where welding is appropriate, it must be of very high quality. Appropriate welding processes may include gas tungsten arc welding (GTAW) and shielded metal arc welding (SMAW). Success in repair of cast iron has been achieved in the past using a nickel welding electrode called a NiRod Ni-99. This rod allows elasticity that eliminates the cracking in the transition zone characteristic of low carbon steel electrodes. It should be combined with peening the weld upon completion, reducing surface stress during cooling. The GTAW process uses silicon-bronze wire and stainless steel wire. These are selected for their compatibility and ductility.

As previously mentioned, we do not typically encourage restoration. It is very costly

Figure 78. Fence Problems. Upper left shows a fence rated in poor condition. The gate, several sections, and individual pickets are missing; coping is displaced; and the fence requires painting. Upper right shows a fence that has been completely lost, being cut off its stone coping using a cutting torch. Middle left photo shows a fence that is almost entirely missing. Middle right shows grass growing over the coping and bottom of the ironwork. Lower left shows a fence classified in fair condition, requiring some structural support and painting. Lower right shows a fence considered to be in good condition that requires only painting.

and funnels money away from preservation activities that have a much greater impact on a much larger assemblage.

Where fence sections are missing, we recommend that "ghost sections," be created and installed. These are simple top and bottom rails sized to match the original ironwork with only a few, if any, vertical pickets. These provide support and help stabilize fences at a very low cost. They can be removed at a later date if the lost sections are recovered.

Where line or corner posts are missing it is usually possible to obtain plain round or square posts to fill the void and allow the fence to be stabilized.

Small elements such as individual finials or individual pickets are essentially aesthetic issues and will not affect the stability and preservation of the fence. We recommend such items receive a very low priority, although occasionally mass produced replacements can be found that come very close to matching original items.

Where recasting is critical, we recommend Robinson Iron in Alexander City, Alabama (http://www.robinsoniron.com/). Castings are typically produced in Class 30 gray iron. We discourage the use of aluminum and alternative metals since they cannot match the original castings. After casting, the individual pieces should be machined as necessary and then primed with a two component epoxy primer.

We identified fence parts lying on the ground in several locations, as well as being stacked against the wall and at a stump in Rest Haven Cemetery. All such parts should be collected and stored for possible repair, replacement, or replication. They should not be ignored and allowed to be stolen or destroyed.

Recommendations

- The Parks Department must require that all work performed in the cemeteries on monuments, fences, or walls be conducted or overseen by a trained conservator who subscribes to the Guidelines for Practice and Code of Ethics of the American Institute for Conservation of Historic and Artistic Works (AIC).

- While a stone-by-stone assessment might further refine stone treatment priorities, there are at least 684 monuments at City and Rest Haven cemeteries that require conservation treatment.

- The cleaning of the worst soiled stones in the cemeteries using D/2 Biological Solution should be undertaken by volunteers. This will dramatically improve overall appearance and provide a very visible improvement to the landscape of the two cemeteries.

- Three plot fences in the two cemeteries are structurally stable, but require caulking, priming, and painting. These should be given a very high priority to prevent further deterioration and increased costs of treatment.

- Ten plot fences in the cemeteries are unstable and require extensive rehabilitation prior to painting. Each of these fences should receive detailed conservation assessments to determine appropriate treatments.

Funding and Priorities

Past decisions, or lack of decisions, have created what can only be described as an extremely dire situation with large sections of crumbling stone walls, four-fifths of the monuments requiring immediate intervention, and most family plot fences requiring attention before they collapse.

Without doubt the one extraordinarily bright spot in this situation is our impression that the City desires to do the best possible job in caring for and preserving these properties.

But, the long-term prognosis for the cemeteries is entirely dependent on the actions taken by the Battlefield Preservation Commission and the recommendations offered to the Mayor and Aldermen over the next several years to support and sustain preservation efforts.

Those actions must be carefully formulated and designed to make substantive changes and promote long-term preservation. Most critically, these preservation efforts will require substantial allocations of funds. We estimate that the conservation of the monuments alone will require over $700,000.

Recommended Priorities

Many municipalities or caregiver groups seem inexplicably out of touch with the problems facing their cemeteries. In the case of City and Rest Haven cemeteries, the City clearly identified many of the main issues, for example noting that "stone/marker preservation – physical structure preservations (i.e., dry stack stone walls, iron work)" were among the most critical issues, followed by "proper maintenance/care." It is refreshing to work with a group that already has a very clear understanding of critical preservation concerns. We hope this study will help refine those concerns.

It is our professional view, based on the questionnaire responses, considerable research, three-days on-site, and several meetings that the five fundamental needs of City and Rest Haven cemeteries are:

1. Improved maintenance operations at the two cemeteries.

   The most beneficial change would be assigning at least three maintenance staff – a crew chief and two technicians – to full-time maintenance of the cemeteries. These individuals would be on-site 5 days a week, 12 months a year.

   These individuals would be responsible for far more than mowing – although we recommend that the use of large deck mowers be eliminated in favor of smaller mowers likely to do less damage. This staff would be responsible for weed control, tree trimming, pruning, seasonal cleanup, conducting section inspections, survey of monuments for maintenance needs, 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.

   Other issues include the addition of water bibs at the entrances of each cemetery since these are critical for turf improvements.

2. Reduction of the pervious boundaries at the two cemeteries.

While cemeteries must not appear as fortresses, they must also have clearly defined boundaries. At both cemeteries this means the stone walls are repaired. At City Cemetery the chain link fence along the northern boundary must be repaired. At Rest Haven Cemetery a chain link fence must be erected along its western boundary. Also important is the effort to soften this western boundary by plantings to minimize the visual intrusion of Hillsboro Road.

A critical component of this work is the repair of the iron gates present at both cemeteries. None of these gates is operable and repair will require their removal, repair, painting, and remounting.

3. Repair the plot fences at both City and Rest Haven cemeteries.

   For some fences all that is needed is careful caulking and painting. Others, however, require creating "ghost" sections to provide structural stability, removal of bottom rails from the soil, and other repairs prior to painting.

4. Begin conservation treatments on the 80% of the monuments in the two cemeteries.

   Some of this work can be accomplished by volunteers or staff, such as resetting of smaller monuments and cleaning of stones prior to their recordation. Other work, such as repair of broken stones and the reconstruction of box and table tombs will require a stone conservator.

   Many of these monuments are a threat not simply to themselves and other monuments, but also to the public. Moreover, many of the monuments have been allowed to deteriorate to the point where intervention is required immediately; waiting for another several years will be too long.
   We understand that the Parks Department wishes to train their staff in these more complex repairs. To accomplish this will require at least three weeks of intensive training, as well as the City's investment in suitable equipment and supplies.

5. Erecting regulatory signs at the two cemeteries.

   While signage seems to be a relatively small concern, we view it as necessary for the City to fully take ownership of these cemeteries and inform the public that there are clear rules and regulations for these historic resources, just as there are for other historic properties in the community.

But even if there is considerable agreement concerning what needs to be done, it is often difficult to prioritize all of the actions necessary to achieve those goals. It is also easy to become distracted as other problems occur. Assigning a permanent staff to the cemeteries will help combat some of this distraction since there will be individuals consistently responsible for the condition and appearance of the cemeteries.

Table 6 lists the recommendations offered throughout this assessment, classifying them as an *organizational need, a first priority, a second priority, or a third priority*.

Organizational needs are rules, policies, or procedural issues that can be quickly resolved by either the Mayor and Aldermen or the Director of the Parks Department. These organizational needs require little or no funding, but do demand a philosophical change in how the cemeteries are operated. They must be enacted as a foundation upon which other changes are constructed. We strongly believe that most cemetery projects fail through inadequate or inappropriate planning – thus, we recommend in the strongest possible terms that the City of Franklin engage in the necessary planning to help ensure success.

First priorities are those we recommend undertaking during the coming fiscal or calendar year (2015). Some are issues that have the potential to affect the public health and safety and consequently require immediate attention.

Second priorities are those that should be budgeted for over the next 2 to 3 years (2016-2017). They represent urgent issues that, if ignored, will result in both significant and noticeable deterioration of the two cemeteries as historic resources.

Third priorities are those that may be postponed for 4 to 5 years (2018-2019), or alternatively, may require 3 to 5 years to see fruition. They are issues that can wait for appropriations to build up to allow action. Some actions are also less significant undertakings that require other stages to be in place in order to make them feasible or likely to be successful. Although they are given this lower priority they should not be dismissed as trivial or unimportant.

Within these four categories, the individual items are not ranked, as all are essentially equal in importance.

It is likely that some of these recommendations will not be achievable in the five years allotted for this plan. That does not mean that the issues will no longer be of consequence or will not still be critical for the survival of City and Rest Haven cemeteries. What it does mean is that after 5 years we recommend sitting down and re-evaluating what has been achieved, what still needs to be done, and determine how to move forward.

Where appropriate, we note that some actions may be suitable for volunteers. We typically do not provide cost estimates since these vary so dramatically from location to location. In addition, costs depend on whether actions are contracted out or conducted in-house. There may also be activities that can be facilitated by other governmental entities with no direct costs.

Although we have not identified per item costs, we have previously remarked that stone repairs may cost in excess of $700,000. Some of these repairs can be conducted by trained staff. If the City would like to consider this option, it would cost about $35,000 for a three-week hands-on training program where Chicora staff works with City staff to repair a variety of the monuments at the cemeteries. The work would cover a range of the different repair techniques previously described and Chicora would provide the initial supplies, such as D/2 Biological Solution, NHL mortar, epoxies, fiberglass and stainless steel pins. The City would be provided with a list of necessary equipment, such as generator, hoses, extension cords, air compressor, drills, and a water source. During the three weeks Chicora would continue to refine and specify additional materials that the City would need to continue the repair process.

This program would provide critical skills to City staff. Perhaps equally important, it would allow the City to make a better informed determination of whether it has the staff time and wishes to invest in the tools and equipment to continue this process.

We believe a period of three weeks is the minimum amount of time necessary to expose the staff to the techniques and procedures necessary to address the range of stone problems in the two cemeteries. We anticipate that staff would be present five days a week, 8 hours a day.

Table 6.
Prioritization of Recommendations

Priority	Action	Notes
Organizational	0.1 A joint meeting of Park staff and the Battlefield Preservation Commission should be devoted to a careful review of the Secretary of Interior Standards. The caregivers should focus on a fuller understanding of how daily operations affect the long-term preservation of the cemeteries, making necessary adjustments to current policies and procedures.	
	0.2 The City should prepare a disaster plan to cover events such as flooding, tornadoes, and other events.	
	0.3 Modifications of proposed regulations include a specific flower policy for the cemeteries. Otherwise the proposed regulations are excellent and should be adopted by Board of Mayor and Aldermen as expeditiously as possible.	
	0.4 The brochure QR codes are an excellent promotional tool; the City should ensure they link correctly with the City web site.	
	0.5 The City should begin integrating additional community activities at Rest Haven and City cemeteries in order to increase visitation and support. Initially at least one activity a month should be planned and within two or three years several activities per month should be sustainable.	
	0.6 The cemeteries should receive a line-item budget allocation commensurate with their needs and the special care that they will require.	
	0.7 All future modifications at the cemeteries should be evaluated for their impact on universal access. Universal access should be a goal whenever possible.	
	0.8 While evidence of vandalism exists in both cemeteries, it is difficult to determine the extent of the problem. The City should, however, review options to combat vandalism and determine which could be implemented to help harden the cemeteries against vandalism.	
	0.9 The City should begin using a form to identify and record evidence of vandalism specific to the cemeteries.	Form provided
	0.10 Homelessness may currently not be a significant cemetery issue, but the City should periodically review the situation. In particular, evidence of inappropriate use of the cemetery must not be overlooked.	
	0.11 The City should not allow the introduction of benches, urns, or vases in the cemeteries.	
	0.12 The City should also be careful to prevent other introductions that are out of character with the historic cemeteries such as flag poles or grave decorations.	

Table 6.
Prioritization of Recommendations continued.

Priority	Action	Notes
Organizational, continued	0.13 The introduction of new memorials must be very carefully monitored and limited. New monuments should be allowed only when the historic monument is no longer legible. In such cases, the original monument must remain and a new flush marker with the precise language of the original marker erected as a lawn marker flush to the ground.	
	0.14 New monuments, marking new burials (if any are allowed) should match existing markers in size, material, and design. If this is not possible, then new markers should be limited to gray granite. Preferably these new markers should be erected as a lawn marker flush to the ground.	
	0.15 The Cemetery Landscape Manager should make monthly written reports to the City regarding activities and conditions at City and Rest Haven cemeteries.	
	0.16 The City should ensure that their employee Code of Conduct includes specific references to appropriate cemetery behavior, such as not sitting or leaning on monuments, or leaning equipment against monuments.	
	0.17 The City should prohibit the creation of graveled plots.	
	0.18 A sign theme should be developed for the cemeteries using consistent colors and type faces.	
	0.19 The City should periodically evaluate whether it would be appropriate to establish a policy that allows staff to remove all “temporary objects” on graves or in plots when they become withered, unsightly, or an obstruction to maintenance.	
	0.20 The City must require that all work performed in the cemeteries on monuments, fences, or walls be conducted or overseen by a trained conservator who subscribes to the Guidelines for Practice and Code of Ethics of the American Institute for Conservation of Historic and Artistic Works (AIC).	
	0.21 Any installation of pathways in the cemeteries will require archaeological investigations.	
	0.22 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. We have provided a list of ISA Certified Arborists for the City to use if necessary.	
	0.23 All trees must be inspected by an ISA Certified Arborist on a yearly basis and after any significant wind storm.	
	0.24 Trees to be planted in the cemeteries must be carefully identified to be historically appropriate and to avoid significant issues such as surface roots, excessive litter, or weak structure.	List provided

Table 6.
Prioritization of Recommendations, continued

Priority	Action	Notes
Organizational, continued	0.25 Every tree removed should be replaced by a new tree. It is also appropriate to plant replacement trees in anticipation of their need.	
	0.26 All replacement trees or new plantings should be 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). All nursery stock should be carefully inspected prior to acceptance and planting.	
	0.28 All new plantings should have water bags and rigid tree guards installed.	
1st Priority (2015)	1.1 The City should establish a dedicated cemetery maintenance staff with a Cemetery Landscape Manager and two Cemetery Landscape Technicians.	
	1.2 Landscape technician activities require a great deal of oversight and the Cemetery Landscape Manager should be on-site during all maintenance activities.	
	1.3 The Cemetery Landscape Manager must exhibit interest in continuing education. We recommend membership in landcare organizations such as PLANET or other similar groups, in addition to the Professional Grounds Maintenance Society.	
	1.4 The City should not only provide educational opportunities to its employees to become certified in landscape areas, but must insist on continuing education as a condition of continuing employment.	
	1.5 The cemeteries require a combined identification and regulatory sign placed at each entrance.	Example provided
	1.6 Obsolete signage at each cemetery entrance should be removed.	
	1.7 The cemeteries will need additional trash containers once Bicentennial Park becomes operational.	
	1.8 The cleaning of the worst soiled stones in the cemeteries using D/2 Biological Solution should be undertaken by volunteers.	
	1.9 The current on-street parking for both cemeteries is acceptable if visitation stays at the current levels.	
	1.10 The use of large deck mowers in both cemeteries is problematical and only 21-inch walk behind mowers should be used where monuments are clustered; open areas may have larger mowers used.	

Table 6.
Prioritization of Recommendations, continued

Priority	Action	Notes
1st Priority, continued	1.11 All mowers must have closed cell foam bumpers installed. These must be replaced as needed. Operators with excessive wear on the bumpers should be given remedial training and instruction.	
	1.12 Mowing must be conducted with sufficient frequency to maintain turf at a height of about 2-inches in cool weather and 3-inches during the growing season.	
	1.13 The line weight used on trimmers is too heavy. We recommend a line no greater than 0.065-inch.	
	1.14 Grass clippings should continue to be blown off all monuments after every mowing or trimming.	
	1.15 All trees removed should have their stumps cut flush with the ground. Stump grinders should not be used.	
	1.37 While a stone-by-stone assessment might further refine stone treatment priorities, there are at least 684 monuments at City and Rest Haven cemeteries that require conservation treatment. While work should begin on critical stones, the repairs will likely span 3-5 years.	
	1.16 About 190 linear feet of the stone wall requires repair. Most of this involves resetting of the angled laminar top stones, although several wall sections do require rebuilding.	City Cemetery
	1.17 The west drive gates should be operable. This will involve removing them from the soil, repairing the bottom rails and pickets, and resetting the gates properly, replacing the lost pivots and repairing pivot arms.	City Cemetery
	1.18 The south pedestrian gate should be removed from the soil and further evaluated for needed repairs.	City Cemetery
	1.19 All boundary gates should be painted, using either an appropriate primer and top coat as specified if there is remnant paint, or using Rust Oleum Rust Reformer and top coats where only bare metal is present.	City Cemetery
	1.20 We do not recommend the replacement of the east drive gate, although the missing stroup should be reset. If it must be replaced, we recommend that it be modeled after the southern pedestrian gate, which we believe dates to at least the nineteenth century.	City Cemetery
	1.21 All weedy plants and vines must be removed from cemetery shrubs. These shrubs must be inspected on at least a yearly basis to ensure they remain clear of intrusive vegetation.	City Cemetery

Table 6.
Prioritization of Recommendations, continued

Priority	Action	Notes
1st Priority, continued	1.22 Weedy plants and vines must also be removed from around stones and within box tombs. An herbicide should be applied to cut stumps to eliminate new sprouts.	City Cemetery
	1.23 All of the vegetation under 4-inches dbh along the northern chain link fence should be removed, including trees that have grown into the fence.	City Cemetery
	1.24 A 10 foot clear zone should be establish on either side of this fence and overhanging branches should be removed to the fence line.	City Cemetery
	1.25 About 160 linear feet of the chain link fence requires repair or replacement.	City Cemetery
	1.26 The pecan tree should be inspected by a certified arborist since it exhibits several problems and may require specific treatment to ensure its continued health.	City Cemetery
	1.27 The pecan tree requires pruning to remove dead wood and to raise the crown.	City Cemetery
	1.28 About 570 linear feet of stone wall at Rest Haven requires repair. About 300 linear feet will involve primarily the resetting of the angled laminar top stones. An additional 270 linear feet, however, will involve extensive rebuilding of the wall.	Rest Haven Cemetery
	1.29 All gates should be made operable. This will involve removing them from the soil, repairing the bottom rails, straightening pickets, and resetting the gates properly, replacing or repairing hinges and column mounts.	Rest haven Cemetery
	1.30 All boundary gates should be painted, using an appropriate primer and top coat as specified.	Rest Haven Cemetery
	1.31 About 600 feet of higher security industrial chain link as specified should be erected along the western cemetery boundary.	Rest Haven Cemetery
	1.32 This fence and the proposed parking on Hillsboro Road must be visually screened from the cemetery to prevent a visual intrusion.	Rest Haven Cemetery
	1.33 The parking on Hillsboro Road must not be allowed to create pedestrian wear at the entry into the cemetery.	Rest Haven Cemetery
	1.34 Weedy plants and vines must be removed from trees, around stones, and from fences. An herbicide should be applied to cut stumps to eliminate new sprouts.	Rest Haven Cemetery

Table 6.
Prioritization of Recommendations, continued

Priority	Action	Notes
1st Priority, continued	1.35 The sidewalk turning off Hillsboro Road on the north side of Margin Street should be removed since it currently dumps pedestrians directly into the cemetery.	Rest Haven Cemetery
	1.36 The magnolia tree at the east edge of the cemetery should be inspected by a certified arborist since it exhibits several problems and may require removal.	Rest Haven Cemetery
	1.37 Sprinklers wetting the north wall must be relocated and/or adjusted to prevent the limestone walls from being wetted. The sprinkler head in the middle of the north entrance must also be moved.	Rest Haven Cemetery
2nd Priority (2016-2017)	2.1 All plot gates should have stainless steel cabling used to attach the gate to the hinge post to reduce the potential for theft.	
	2.2 Soil tests indicate that the major issue at the two cemeteries is the low pH. This should be rectified by liming the two cemeteries and testing the soils again in a year. If fertilizers are added, they should be organic in order to minimize salt levels.	Specifications provided
	2.3 Additional soil tests should be conducted in 2015, after liming, to determine if additional treatments or fertilization are needed.	
	2.4 All cemetery trees must be pruned to remove dead wood at no greater than five year intervals.	
	2.5 "Orphan" stones should be documented using a form and collected for short-term safe keeping until their appropriate location is identified through research. In so far as possible, stones should not be allowed to become disassociated with their graves as this effectively loses the grave location.	
	2.6 Three plot fences in the two cemeteries are structurally stable, but require caulking, priming, and painting.	
	2.7 The City should place bollards at drive gate entrances to prevent vehicle entry.	
	2.8 Older, mature trees in the cemeteries should have turf removed from under their drip lines and 3-inches of mulch installed.	
	2.9 Scalping of the grass must be prevented by more careful grave filling and seeding after all graves have been mapped.	
	2.10 The cemetery turf exhibits extensive weed invasion. The City should institute a weed control program, using preemergent and postemergent herbicides.	

Table 6.
Prioritization of Recommendations, continued

Priority	Action	Notes
2nd Priority (2016-2017) Continued	2.11 The 1916 gate columns require pointing using a softer mortar than the existing Portland cement mortar.	City Cemetery
	2.12 The east entrance gate columns require extensive pointing using a 1:2.5 mix of gray NHL 5 and sand.	Rest Haven Cemetery
	2.13 The east entrance flanker walls require rebuilding.	Rest Haven Cemetery
	2.14 Existing brass signs in Rest Haven Cemetery either should be removed entirely or reset flush to the ground on concrete pads.	Rest Haven Cemetery
3rd Priority (2018-2019)	3.1 Historic research should focus on the newspaper and city records to obtain a fuller understanding of the cemeteries and their use.	
	3.2 Future consideration should be given to establishing grass tracks underlain by a reinforcing system to achieve ADA compliance on selected pathways of appropriate widths and road access.	
	3.3 Ten plot fences in the cemeteries are unstable and require extensive rehabilitation prior to painting. Each of these fences should receive detailed conservation assessments to determine appropriate treatments.	
	3.4 The southern pedestrian gate should be locked closed since there are no sidewalks or other convenient pedestrian access routes along the south.	
	3.5 All boundary fence lines should be inspected by the City on a yearly basis to ensure their maintenance.	
	3.6 Lawn renovation should be undertaken to promote a pure stand of fescue at the cemeteries.	
	3.7 Plot curbs or coping throughout the cemeteries are in deteriorating condition. The repair of these curbs must be viewed as routine maintenance and must be integrated into the maintenance plan.	
	3.8 The cemetery requires the installation of hose bibs at the three entrances both for landscape maintenance and also stone cleaning.	City Cemetery
	3.9 The cemetery requires the installation of hose bibs at the two entrances both for landscape maintenance and also stone cleaning.	Rest Haven Cemetery

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Cemetery Preservation Plans

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Chicora Foundation, Inc.
PO Box 8664 ▪ 861 Arbutus Drive
Columbia, SC 29202-8664
Tel: 803-787-6910
Fax: 803-787-6910
www.chicora.org