

PENNSYLVANIA HERITAGE AREAS AFRICAN AMERICAN CEMETERY PILOT PROGRAM



THORNBURY AME CHURCH CEMETERY PRESERVATION PLAN Glen Mills, Delaware County, Pennsylvania

PREPARED FOR:

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In partnership with:
Pennsylvania Hallowed Grounds and Heritage Pennsylvania

June 30, 2023

RGA Technical Report 2022-341PA



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THORNBURY AME CHURCH CEMETERY, GLEN MILLS, DELAWARE COUNTY, PENNSYLVANIA

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1.0 PROJECT DESCRIPTION AND METHODOLOGY

Project Description

The Pennsylvania Heritage Areas African American Cemetery Pilot Program is a partnership between Preservation Pennsylvania (Preservation PA), Pennsylvania Hallowed Grounds (PAHG), Heritage Pennsylvania (HeritagePA), and Pennsylvania's Heritage Areas (PHA). The project's stated goal is to develop individualized preservation action plans for three pilot cemeteries and select a project to be undertaken by cemetery stewards and volunteers at each pilot cemetery. Administered and managed by Preservation PA and PAHG, this pilot program was financed in part by a grant from the Community Conservation Partnerships Program, the Heritage Areas Program under the administration of the Pennsylvania Department of Conservation and Natural Resources, Bureau of Recreation and Conservation.

The PHA was established to identify, protect, develop, enhance, and promote the historic, recreational, natural, cultural, and scenic resources of the Commonwealth of Pennsylvania and to stimulate community revitalization and economic development through regional heritage conservation, recreation, tourism, and partnerships.

PAHG's mission is to honor, interpret, and preserve African American cemeteries and the burial sites of Civil War African American sailors and United States Colored Troops in Pennsylvania. The organization connects and builds the capacity of stewards of these cemeteries and burial sites, and supports conservation, documentation, education, and training. Working collaboratively with other groups and organizations, PAHG provides tangible encounters with memory and enriches the public understanding of history.

Preservation PA is the Commonwealth's only private statewide nonprofit organization dedicated to helping people protect and preserve the historic places that matter to them. The organization assists individuals, organizations, corporations, and governmental agencies from across the Commonwealth (and sometimes the nation) in their own preservation-related efforts, through a dynamic scope of activities and services. Whether as a leader, partner, or advisor, Preservation PA works to secure the future of the past through educational outreach workshops and events, legislative advocacy, advisory and technical assistance in the field, and other special initiatives.

The scope of work for the Pennsylvania Heritage Areas African American Cemetery Pilot Program project includes the following:

- RGA will work with cemetery stewards to identify a specific project that volunteers can undertake as part of the plan before the pilot project's end date of June 30, 2023.
- RGA will visit each cemetery and meet with the cemetery's stewards to listen and learn about each site, its operations, features, and preservation needs. The consultant will then prepare a written evaluation and a site-specific maintenance and preservation plan for each cemetery that will identify and prioritize the steps required to appropriately maintain and preserve the site. The plan will identify work that volunteers can complete, and work requiring the skills of professionals. The plan should also provide practical steps for helping the cemetery stewards to implement its recommendations.
- Coordinating with Preservation PA in partnership with PAHG and Heritage PA.

Preservation PA, PAHG, and their partners selected the three cemeteries participating in this pilot program; served as advisors to the volunteer projects; promoted this project; and highlighted the work of participating cemeteries. The three historic African American cemeteries selected for this pilot program are in the Schuylkill River Greenways Heritage Area

and have an active stewards group working to care for the cemetery. The goal of this pilot program is to provide a model for future cemetery preservation efforts across Pennsylvania (Figure 1.1).

This report is arranged in five chapters. Chapter 1 contains the project description, background, and the methods used to complete the study. Chapter 2 presents a physical description of the Thornbury Cemetery and presents a summary of the cemetery's physical and administrative development which have brought the cemetery to its current state. Chapter 3 presents a general, big-picture assessment of the cemetery's landscape features, gravemarkers, and overall conditions. Chapter 4 outlines a preservation plan with goals, objectives, and recommendations for Thornbury Cemetery's stewards, and includes examples of successful projects at other African American cemeteries. Chapter 5 outlines specific projects that cemetery stewards and volunteers can undertake, and projects that require professional assistance from historic preservation and cemetery preservation consultants. Chapter 6 contains the list of resources cited in the report. The appendix has instructional materials on cemetery terminology and ways to properly preserve and maintain historic cemeteries.

Ellen Turco, MA, Principal Senior Historian and North Carolina Branch Manager, served as the project manager, and Jason Harpe, MA, Director of Cemetery Conservation, conducted background research and fieldwork and served as the author of this report. Both meet the professional qualifications standards of 36 CFR 61 set forth by the National Park Service (NPS). David Strohmeier produced the report graphics. Aja Bain served as technical editor and formatted the report. (Staff resumes are included in Appendix A).

Project Background

In November 2022, Preservation PA issued a Request for Proposals for the PHA's African American Cemetery Pilot Program. RGA responded to the RFP and was awarded a contract to complete the work in December 2022. Preservation PA contracted with RGA to work with volunteer stewards of two or three historic African American cemeteries in Pennsylvania, to be selected by Preservation PA and PAHG, to develop an actionable, site-specific preservation plan for each cemetery.

The RFP outlined the following project background:

Preservation Pennsylvania in partnership with PA Hallowed Grounds is seeking to undertake a pilot project to provide services to African American cemeteries in Pennsylvania. This pilot program is being funded by Heritage PA using DCNR funds as part of Contract BRC-SR-25-117 through a subcontract agreement. The consultant for this project will be contracted by Preservation Pennsylvania. This is a small pilot program, narrow in scope and budget. Interest and results will inform future rounds of funding and may lead to additional work.

On Monday, December 12, 2022, RGA hosted a project kick-off meeting with Preservation PA staff and board members of PAHG. Attendees were Ellen Turco, Principal Senior Historian, and Jason Harpe, Director of Cemetery Conservation, of RGA; Sabra Smith of Preservation PA; and PAHG board members Barbara Barksdale (PAHG chairperson), Bertha Jackmon, Dr. Steven Burg, Brenda Barrett, Jeanie Glaser, and Sheila Jones. The purpose of the meeting was to introduce RGA staff to project stakeholders and to evaluate the 11 pilot cemetery candidates. Candidates were located within Pennsylvania's Heritage Areas and consisted of cemeteries of various sizes that were associated with churches, or were privately owned, or whose ownership was uncertain. Each cemetery was confronted with management challenges typical of historic cemeteries.

Mindy Crawford, Preservation PA's Executive Director, emailed the candidate applications to all kick-off participants prior to the meeting. Barbara Barksdale presented each of the applications after introductions and explanations from each board member about their involvement with PAHG and in the project. Participants discussed each application at length and asked Ms. Turco and Mr. Harpe for their input. Turco and Harpe requested a few more days to review the applications, after which time they responded to PAHG by email with the three candidates they believed best suited the goals of the



Figure 1.1: Pennsylvania Heritage Areas
 (Courtesy of Mindy Crawford, Preservation Pennsylvania).

pilot program. The three cemeteries were proximate to each other, which afforded RGA staff the time necessary to meet with the stewards, access the conditions of the cemeteries and gravemarkers, and take photographs within an allotted two-day timeframe.

Thornbury Cemetery was one of the three cemeteries selected by the project partners to participate in this pilot program (Figures 1.2–1.3).

The stewards of Thornbury Cemetery stated the following goals in their application for the pilot project.

“to maintain the land, to preserve the land as historical marking, to educated and to memorialize our war heroes and church family members that are bury on the land...To keep the head stones clean and to lift those that has fallen over. We need the headstone remark names have disappeared. We need tools to do the work on sagging head stones, damaged grave markers, rampant weeds, and untrimmed trees.”

Methodology

Shelby Spain’s Multiple Property Documentation Form (MPDF) titled *African American Churches and Cemeteries in Pennsylvania, c. 1644-1970* is a valuable research tool that establishes terminologies and concepts for evaluating African American cemeteries. Based on Spain’s definitions, Thornbury Cemetery is a “Black Church Legacy Graveyard.” Spain used “Black Church” to refer to the seven historically predominant Black Protestant denominations, and she defines a “Legacy Cemetery” as “one in which graves are original to the cemetery and not relocated from a different cemetery.” She defines a “Graveyard” as “an area of land reserved for the burying of dead people that is historically and functionally related to a church or place of worship” (Spain 2018:7–8). In 2018, the Pennsylvania State Historic Preservation Office, in partnership with PAHG, received funding from the NPS for Spain’s historic context study. The NPS approved Spain’s MPDF in 2021. The goal of the context study is to help document and nominate Pennsylvania’s African American churches and cemeteries for listing in the National Register of Historic Places.

One of the largest repositories of secondary source material on Thornbury Cemetery is Newspapers.com. RGA staff’s precursory search using the keywords “Thornbury AME Church Cemetery” yielded over 25 obituaries for decedents buried at the cemetery, as well as a few articles from the 1980s and 1990s on the church’s history. If Thornbury Cemetery’s stewards can sign up for a 90-day free trial account or get access through their local library, they can download all the articles on the cemetery, its decedents, and historical events involving the cemetery. These articles are an extremely useful resource for current and future researchers, and the cemetery stewards should add these articles to their archives.

In the preparation of this preservation plan, RGA staff used preservation planning strategies and instructional material available on the NPS website, as well as adding new creative strategies that are applicable to Thornbury Cemetery. RGA followed the broad requirements of the Secretary of the Interior’s Standards for Rehabilitation and NPS’s *Preservation Brief 48: Preserving Gravemarkers in Historic Cemeteries*, which is considered the industry standard. *Preservation Brief 48* addresses each aspect of cemetery preservation and provides baseline guidance that must always be followed for any project involving cemeteries. Additionally, RGA consulted the Chicora Foundation Inc.’s *Recording Historic Cemeteries: A Guide for Historical Societies and Genealogists* and Lynette Strangstad’s *A Graveyard Preservation Primer*.

There are myriad resources on cemetery preservation and planning available online written by conservators, historic preservationists, landscape architects, and arborists. States such as Alabama, Illinois, and Texas, as well as Prince George’s County, Maryland, have published historic cemetery preservation guides, but the *Historic Cemeteries Preservation Guide of Michigan* is the most thorough and detailed on the conservation of gravestones and monuments. The Massachusetts Department of

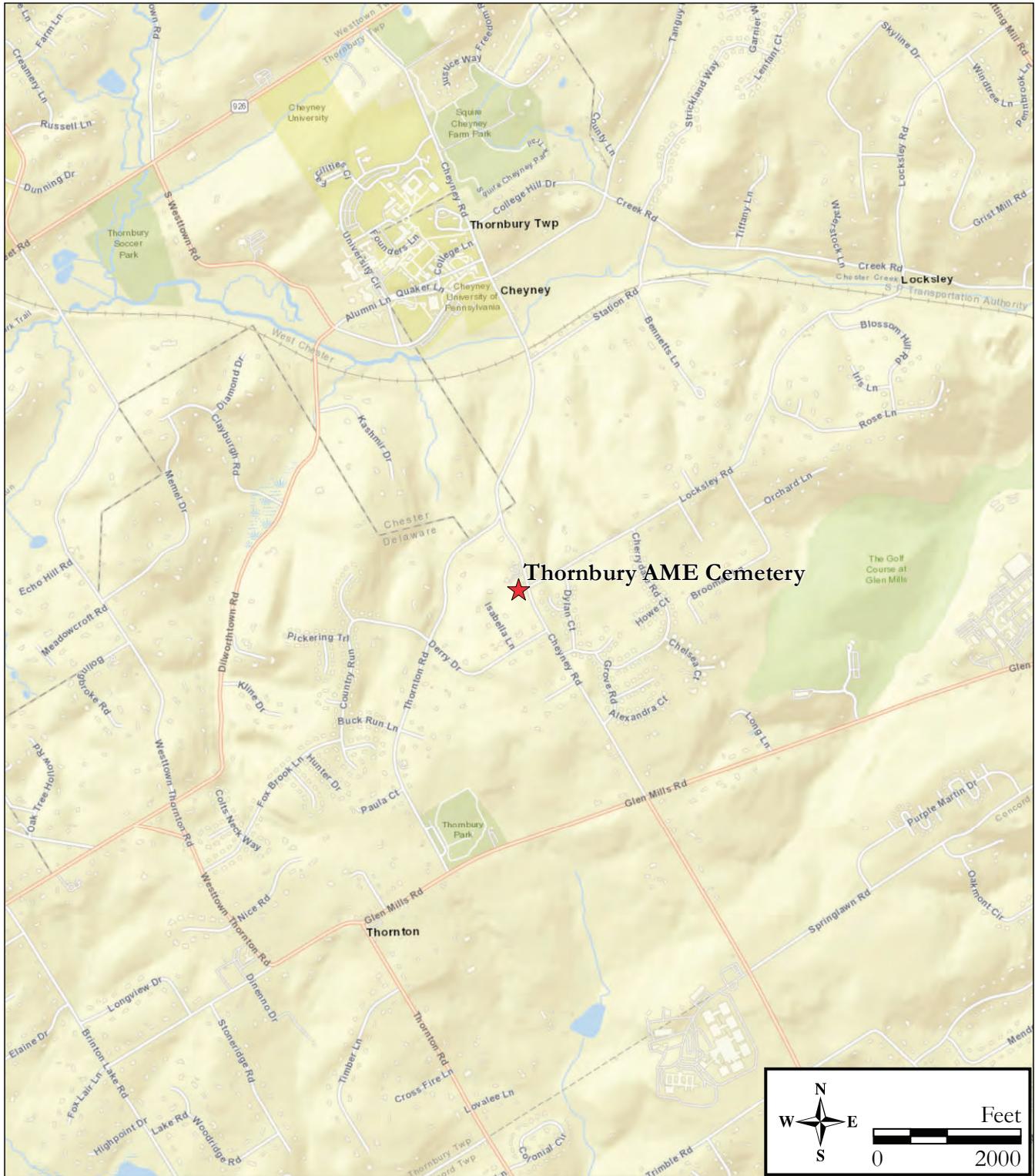


Figure 1.2: Road map of Thornbury AME Church and Cemetery (World Street Map, ESRI 2022).



Figure 1.3: Aerial map of Thornbury AME Church and Cemetery.
The church is in the northeast corner of the highlighted area.
(World Imagery, ESRI 2022).

Conservation and Recreation has a section titled “Guidelines for Preservation Planning” in their publication *Preservation Guidelines for Municipally Owned Historic Burial Grounds and Cemeteries*, third edition (2009). The Massachusetts guidelines “offer a compendium of information directly related to the preservation, restoration, rehabilitation, reconstruction, management and care of the Commonwealth’s municipally owned historic burial grounds and cemeteries” (Massachusetts Department of Conservation and Recreation 2009:13). RGA consults these and other cemetery preservation and conservation resources regularly.

A section of the Pennsylvania Historical and Museum Commission (PHMC) website is devoted to the preservation of historic burial grounds and cemeteries. PHMC’s website offers guidance on cemetery issues such as the developmental history of Pennsylvania cemeteries; Pennsylvania cemetery laws; tools for cemetery documentation; funerary symbolism typical of Pennsylvania; guidelines for preservation planning for historic burial grounds and cemeteries; and guidelines for the treatment of cemetery components. RGA recommends that Thornbury AME Church Cemetery’s stewards consult PHMC’s website (<http://www.phmc.state.pa.us/portal/communities/cemetery-preservation>) and use their cemetery survey forms to document the cemetery and its gravemarkers.

Fieldwork

RGA strategically planned Jason Harpe’s meeting with the stewards of Thornbury Cemetery to maximize the project’s limited budget and timeline. Mr. Harpe divided a full day of meeting time and fieldwork between Lindley Hill Cemetery and Thornbury Cemetery.

On Thursday, January 19, 2022, Mr. Harpe visited Thornbury Cemetery and met with the Thornbury AME Church’s pastor, Angela Baker, and cemetery steward Andrew Alexander. Ms. Bertha Jackmon of PAHG and Twyla Simpkins of Green Lawn Cemetery joined the meeting and participated in conversations about the pilot program, PAHG, and how each of the cemeteries selected for the pilot program can benefit from sharing their individual experiences of preserving historic African American cemeteries.

After introductions, Ms. Jackmon relayed to the cemetery stewards all the details of the African American Cemetery Pilot Program and outlined PAHG’s mission and history. Mr. Harpe spoke of his academic background and vocational skills in historic preservation and detailed how cemetery preservation changed the trajectory of his career and became the major focus of his professional pursuits. The group decided to spend the first part of the meeting focusing on each of the steward’s connections to Thornbury Cemetery.

The church has a large, printed map of the cemetery with notations on various burial plots and the names of decedents buried in the cemetery, but Mr. Harpe did not have the necessary equipment to digitize the map. Harpe encouraged the church’s stewards to get the map professionally digitized. After meeting with the cemetery stewards, Mr. Harpe walked the cemetery grounds, took photographs, and assessed the cemetery’s physical condition (Figure 1.4–1.7).



Figure 1.4: Bertha Jackmon, Pennsylvania Hallowed Grounds, looking at a map of the Thornbury AME Church Cemetery with Andrew Alexander, a member of Thornbury AME Church (Courtesy of Twyla Simpkins).



Figure 1.5: Jason Harpe, RGA's Director of Cemetery Conservation, talking with Bertha Jackmon, Pennsylvania Hallowed Grounds, and Pastor Angela Baker and Andrew Alexander of Thornbury AME Church about cemetery preservation. (Courtesy of Twyla Simpkins).



Figure 1.6: Jason Harpe, RGA's Director of Cemetery Conservation, talks with Thornbury AME Church cemetery stewards about cemetery preservation (Courtesy of Twyla Simpkins).

Figure 1.7: Jason Harpe, RGA's Director of Cemetery Conservation, talks with Thornbury AME Church cemetery stewards about cemetery preservation (Courtesy of Twyla Simpkins).



2.0 PHYSICAL DESCRIPTION AND BRIEF HISTORY OF THORNBURY AME CHURCH AND CEMETERY

Physical Description

Thornbury AME Church Cemetery (PIN #44000002601) at 646 Cheyney Road in Glen Mills, Delaware County, Pennsylvania, is a small African American church cemetery that is still active. The cemetery is on an irregularly shaped tract to the northeast, west, and south of the Thornbury AME Church building. The cemetery property is bounded on the north, south, and west by residential buildings dating to the 1980s and 1990s, and on the east by Cheyney Road, near its intersection with Lockley Road. The church and cemetery are in a predominantly residential part of Glen Mills, Pennsylvania, .75 miles southeast of Cheyney University and approximately 5 miles southeast of downtown West Chester.

Thornbury AME Church Cemetery is accessed by a small, square-shaped, paved parking lot at the property's eastern edge between the church building and Cheyney Road, and a larger rectangular, paved parking lot at the property's southern edge. A heavily wooded thicket extends across the full length of the property's eastern edge and half of the north edge, buffering the cemetery from residential buildings. One large hardwood tree stands in the cemetery near the church's southwest corner, and a second tree is at the property's northern edge between the church building and an adjacent residential dwelling.

The cemetery's landscape is relatively level but slopes slightly towards the property's northern edge. The cemetery grounds are grassed and well-maintained by cemetery stewards. There is a lack of shrubs, hedges, and intentional plantings in the cemetery. Thickets cover small cast concrete gravemarkers at the property's western and northern edges.

The cemetery has marked graves arranged in a relatively linear fashion from north to south with burials oriented east to west. There is an overall uniformity maintained by gravemarkers of nearly equal height, and a lack of fences around family plots. The markers are reflective of the types typically found in African American cemeteries including ground-supported tablets, die-on-base, tab-in-socket, military service markers, folk concrete markers, and lawn-style markers. The markers are made of marble, concrete, and granite. The Smith family burial plot has the cemetery's only enclosure. The enclosure's peaked granite coping posts and decorative, round metal pipe railing enclose unmarked, shallow grave depressions.

Buried in the cemetery are men who served in some of our country's major wars. Men who served the Union Army as members of the United States Colored Troops during the Civil War include Lemuel H. Blakes (d. 1885), Charles Momen (d. 1920), George Derry (d. 1930), Solomon Dean (d. 1911), William Flowers (d. 1903), William Patton (d. 1920), Reuben Johnson (d. 1924), and Robert Henry (d. 1911). Blakes served with the famed 54th Massachusetts Infantry Regiment.

Thornbury Cemetery, like many African American cemeteries, has topographic (grave) depressions, or sunken areas caused by burials. Older graves without modern concrete burial vaults sink over time once the grave shaft fill settles and the coffin collapses. Depressions appear in a pattern (mostly in north-south oriented rows) and indicate an unmarked grave when an associated marker is not present. Not all unmarked graves show up as depressions. In certain cases, subtle depressions can be observed by a slightly different shade of grass (i.e., from increased moisture retention) or during the early dawn or dusk when the sun appears at an angle (Figures 2.1–2.14).

Brief History of Thornbury AME Church and Cemetery

The history of Thornbury AME Church, originally called Bethel at Thornbury, begins in 1834 when Thornbury AME Church's founders officially organized themselves into a church body. The church began in a small frame schoolhouse on what is today Westtown Road that



Figure 2.1: Thornbury AME Church, south elevation.
Photo View: North; Photographer: Jason Harpe; Date: January 19, 2023.

was originally used by Nathan Hunt, a prominent member of the Chester County Quaker community. During the 1830s and 1840s, a period of intensity surrounding the issue of slavery in the United States, African Americans in and around Philadelphia encouraged a movement of economic and educational self-help among members of their communities. Thornbury Church's founders felt that "common schools, Sunday schools, and temperance societies are of the highest importance to all people; but more especially to us as a people" (Thornbury AME Church 2023; McCullough 1993:B1).

In 1840, movers relocated the Nathan Hunt building 0.5 miles from the original site and along the same road to property near James Sullivan's home, at what is today the intersection of Cheyney Road and Locksley Road, and converted it into a church. At this time, the church did not have a regular pastor, and depended on a circuit preacher to meet the congregation's spiritual needs. Throughout its history, the church's pastors were from Philadelphia, as is the current pastor Rev. Angela Baker (Copes 1972:15; Corr 1999:B2).

Ten years after the Civil War, the congregation purchased land from Ruth and John Pierce to increase the size of their cemetery. The cemetery's earliest marked burials date from 1860 to the 1890s, and the church believes there may be unmarked burials in their cemetery for men and women who died while traveling from the South to the North on the Underground Railroad.

The church has traditionally had a small congregation but has been able to host annual conventions of the AME Church and make a positive impact in their community. During the 1940s and 1950s, the congregation numbered between 50 and 60, but during the 1970s had only 25 members.



Figure 2.2: Cornerstone, Thornbury AME Church, east elevation.
Photo View: West; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.3: Thornbury AME Church Cemetery, west elevation.
Photo View: West; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.4: Thornbury AME Church Cemetery, west elevation.
Photo View: West; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.5: Thornbury AME Church Cemetery, northwest corner.
Photo View: North; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.6: Thornbury AME Church Cemetery, west elevation.
Photo View: West; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.7: Thornbury AME Church Cemetery gravemarkers, west elevation.
Photo View: West; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.8: Thornbury AME Church Cemetery gravemarkers, west elevation.
Photo View: West; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.9: Thornbury AME Church Cemetery gravemarkers, west elevation.
Photo View: West; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.10: Thornbury AME Church Cemetery gravemarkers, northwest corner.
Photo View: South; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.11: Thornbury AME Church Cemetery gravemarkers, west elevation.
Photo View: South; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.12: Thornbury AME Church Cemetery gravemarkers, west elevation.
Photo View: South; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.13: Thornbury AME Church Cemetery, southwest corner.
Photo View: Northeast; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.14: Thornbury AME Church Cemetery, north elevation.
Photo View: North; Photographer: Jason Harpe; Date: January 19, 2023.

The congregation remodeled their church building in 1910 and had to completely rebuild the building (with help from the surrounding community) after it was destroyed by a snow and ice storm in March 1958. Local contractor Lawrence Derry rebuilt the church from plans drawn by architect W.M. Stanton, and the Glen Mills Quarry contributed the materials to pour a blacktop driveway and parking space. While Derry and others rebuilt the church's building, the congregation worshipped at St. John's Episcopal Church in Concord. They laid the cornerstone for the new building and resumed regular services in June 1959 (Copes 1972:15; Corr 1999:B2).

Gravemarkers

As of February 2023, contributors to Thornbury Cemetery's FindAGrave.com page added 253 memorials (entries), but 163 of these memorials have digital photographs of death certificates or obituaries instead of gravemarker photographs to prove the decedents' interment at the cemetery. Of the remainder, 61 entries have no photographs at all, 28 have photographs of gravemarkers, and one has a digital photograph of a Delaware County Record of Burial Place of Veteran card.

The marked graves are arranged in a relatively linear fashion from north to south with burials oriented east to west. The gravemarkers are primarily ground supported tablets, die-on-base, plaque, and lawn-style gravemarker forms, and are made of marble, granite, and concrete. They are set directly into the ground or mounted to a base of similar material. There is an overall uniformity maintained by gravemarkers of nearly equal height, and there is only one family burial plot enclosure in the cemetery. The cemetery's gravemarkers maintain a moderate level of material integrity, but some of the upright gravemarkers have been detached from their bases and are lying flush with the ground.

The cemetery stewards should clear the thickets at the property's eastern and northern edges so they can make an accurate count of how many gravemarkers are in these areas.

The cemetery's gravemarkers date from 1860 to the church's most recent burial for William W. Whitehead who died on July 26, 1978, and are ground-supported tablets, tab-in-socket, and die-on-base gravemarker types. These gravemarkers are made of marble, granite, and concrete. Mark Blakes (d. 1860) ground-supported tablet is the cemetery's earliest gravemarker, and the diminutive marble die-on-base for Mary E. Smith (d. 1880) and granite die-on-base for Mary M. Momen (d. 1899) are the only other gravemarkers that date to the nineteenth century (Figures 2.15–2.25).



Figure 2.15: Thornbury AME Church Cemetery, west elevation.
Photo View: East; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.16: Thornbury AME Church Cemetery gravemarkers, west elevation.
Photo View: South; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.17: Thornbury AME Church Cemetery, west elevation.
Photo View: West; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.18: Thornbury AME Church Cemetery gravemarkers.
Photo View: South; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.19: Thornbury AME Church Cemetery gravemarkers.
Photo View: Southeast; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.20: Thornbury AME Church Cemetery gravemarkers.
Photo View: South; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.21: Thornbury AME Church Cemetery, south elevation.
Photo View: South; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.22: Thornbury AME Church Cemetery gravemarker.
Photo View: West; Photographer: Jason Harpe; Date: January 19, 2023.



Figure 2.23: Thornbury AME Church Cemetery grounds issues.
Photo View: West; Photographer: Jason Harpe; Date: January 19, 2023.

3.0 OVERALL ASSESSMENT OF THORNBURY AME CHURCH CEMETERY

Grounds Maintenance and Management

Overall, Thornbury Cemetery is in very good condition, and its regular mowing schedule has made the cemetery look well-kept and cared for. The church's continued maintenance and acknowledgement of the cemetery's historical and cultural significance should help curb any future vandalism to the gravemarkers.

While Thornbury Cemetery's grounds are currently in good condition, many gravemarkers with multiple components are damaged and displaced. Vandalism and falling limbs from trees in the cemetery are the likely culprits of this damage. Cemetery stewards should consult an experienced conservator before allowing any repairs to the damaged gravemarkers. RGA encourages the cemetery stewards to consider cleaning the gravemarkers that have atmospheric staining and biological growth, but only after they have read the instructions in Section 4.0 of this report.

Thornbury Cemetery has unlevel ground and depressions that may be associated with burials, as well as groundhogs. (Information about creating a plan for dealing with groundhogs is included in Section 4.0 Preservation Plan: Maintenance.) Some of the depressions are very consistent with a slight caving in or sinking of the earth that is attributable to the decomposition of a coffin to the point of collapsing, but other depressions could result from other types of ground disturbance such as deteriorating tree roots, erosion, water runoff, or activities associated with the church and its congregation. Cemetery stewards have expressed concerns over the depressions being a safety hazard and proposed to remedy the situation by filling in the depressions. They should avoid backfilling until they are able to conduct a ground-penetrating radar (GPR) survey in the cemetery. If the cemetery stewards decide to backfill the depressions, they should first mark the head of the burial with a memorial stone. RGA can provide photographic examples of memorial stones used by other cemetery stewards to mark the locations of unidentified decedents.

Thornbury AME Church and Cemetery are identified by a metal and glass sign near the church's southeast corner that bears the name of the church and has a display area where the pastor and church member can publicize their upcoming services and events. The sign is in relatively good condition and consistent with the size of the gravemarkers in the cemetery, but it has biological growth and paint is chipping from the bottom of the metal posts. The sign should be scraped, primed, and repainted.

While Thornbury Cemetery still has some issues that will take time to address, there are positive things that RGA identified while conducting fieldwork. Our team noted that there is very little trash in the cemetery. We found only discarded weed eater string. The lack of trash may be the result of very few people visiting their ancestors who are buried in the cemetery and people who are living in the community around the cemetery not walking through it. Little foot traffic in the cemetery may also contribute to the absence of dog feces on the cemetery property. Sadly, this is a problem RGA has noted in nearly every cemetery where we have conducted conditions assessment or done conservation work. The stewards of some cemeteries maintain strict rules prohibiting dogs on the property, but many do not. RGA staff also noted the absence of dead grass from herbicides around the gravemarkers. The cemetery stewards should continue this practice and avoid the use of multi-spectrum herbicides such as Roundup to eradicate grass around the gravemarkers.

Gravemarkers' Deteriorated Conditions

Gravemarkers and monuments of all types and forms in Thornbury Cemetery have sustained damage from vandalism and mechanized equipment, and have atmospheric staining, soiling, and some biological growth. Gravemarkers are leaning, displaced, broken, sunken, missing

components, and deteriorating. The marble and concrete gravemarkers are in the most immediate need of leveling, conservation, and restoration. Granite die-on-base gravemarkers are the cemetery's predominant type and are to a certain degree, when compared to the marble and concrete gravemarkers, sound and stable. Granite became one of the most enduring stones during the 1880s and remains the preferred stone material for gravemarkers and monuments because it is hard, heavy, and durable (Anson-Cartwright 1998:12).

The granite die-on-base gravemarkers at Thornbury Cemetery do not display an accelerated level of deterioration, but they have atmospheric staining and biological growth and many of the dies are not secured to their accompanying bases. These gravemarkers are also tilted because their bases were set directly on the ground without any type of aggregate foundation to provide stability to counteract shifting or the effect of gravity (King 2004:92). Some of the dies are no longer oriented in their original position on the base because water has infiltrated the space between the die and base and during a freeze-thaw cycle has "walked." During the freeze-thaw cycle, water that infiltrated open spaces in the stone can expand in volume by close to 10 percent and cause a die to rise off the base and settle in a disoriented position when the water thaws.

Broken gravemarkers, particularly those made of marble and concrete, that are displaced and laying on the ground for extended periods of time have sunk and been overtaken by grass. Deterioration of these displaced and broken pieces is accelerated by constant exposure to moisture in the soil, lawn mowers and weed eaters, and herbicides. Marble is very porous and susceptible to "sugar decay," a phenomenon "in which acid precipitation attacks along the joints or boundaries between the calcite crystals that comprise marble" and "the grains or crystals are ultimately loosened and can be brushed off like granulated sugar" (Anson-Cartwright 1997:8).

Unlike many cemeteries, the gravemarkers and monuments observed while conducting fieldwork at Thornbury Cemetery do not seem to have any inappropriate previous repairs. The only extant materials used to secure stone components of gravemarker types such as die-on-base is the original mortar or monument setting compounds. Many historic cemeteries display ingenious but ill-suited repairs by stewards with good intentions that are contrary to traditional conservation standards. The lack of these repairs to Thornbury Cemetery's gravemarkers is ideal because it limits the potential of compromising the integrity of the stone during restoration (King 2004:123).

Gravemarkers that are currently upright are leaning more than 15 degrees into their respective rows. Leaning stones may lean because they have shifted, have been purposefully dislodged, or simply because of gravity. Ground-supported tablets that are leaning could become warped and, in the worst case, could break due to their own weight (King 2004:92).

4.0 PRESERVATION PLAN

Signage

To deter loitering and vandalism, RGA encourages cemetery stewards to install a sign at the main entrance drive that gives the cemetery's hours (i.e., dawn to dusk), rules (i.e., no gravestone rubbings, clean up after your dog, no loitering, no interments without prior authorization) and contact information (i.e., for more information or to volunteer, report vandalism, or to arrange vehicular access, contact Thornbury Cemetery's stewards). Cemetery stewards should notify local law enforcement of the posted hours and encourage them to deter visitors after hours. The cemetery stewards should check with local officials regarding any requirements or ordinances prior to posting the signs. Local sign companies and online sign providers can make signs quickly and at a low cost.

Cemetery stewards should discourage grave rubbings, a process where images of gravestone carvings are captured by placing a sheet of paper over the carvings and rubbing with a pencil, crayon, or other utensil. This process can cause permanent damage when the writing medium extends off the paper and onto the stone itself, and the pressure placed on the marker during the process can cause the gravemarker to topple. Damage to stones, such as delamination or splitting, can also be made worse through the impacts of grave rubbings.

Cemetery stewards should report vandalism or observed damage to the local authorities. Documentation serves to keep the cemetery stewards' records complete and may be invaluable in associated criminal or civil proceedings. Criminal and civil cases can take years to make their way through the legal system; it is in the cemetery stewards' best interest to rely on detailed and complete records made at the time, rather than someone's long-term memory (Figure 4.1–4.2).

Site Clearing

The cemetery stewards have an established maintenance schedule for the cemetery. RGA recommends that the stewards remain steadfast on their regular maintenance schedule while clearing the thickets so that they can document the gravemarkers.

While conducting fieldwork, RGA staff was not able to walk through the thickets along the cemetery's western edge and a portion of the north edge. RGA encourages the cemetery stewards to clear these thickets so that they can determine how many gravemarkers are in these areas.

The first impulse for many organizations is to rush into these overgrown areas with a bushhog or broadcast multi-spectrum herbicides, but these approaches can cause significant damage and loss of information in a cemetery setting. When clearing a cemetery, it is important to ensure that no gravemarkers or other landscape features, including deliberate plantings, fieldstones, broken stones, and plot markers, are moved prior to documentation. The use of plain, undecorated fieldstones as gravemarkers is documented for African American graves, as well as in other circumstances where the financial resources were not available to purchase a custom headstone (Little 1998:36; Kruger-Kahloula 1989:33). Much of the information that can be gleaned from these landscape features is based on their physical location within the cemetery; for example, gravemarkers that are moved from their original placement are no longer gravemarkers, since they lose their association with the remains of the deceased. Moving stones also obscures family and other relationships that may be evident from the stone's location relative to those of other individuals. Moving a stone is a decision that must be made carefully. Stones should not be moved to make straight rows, create pathways or to "correct" the direction of the way they are facing.

If it is necessary to move stones or stone fragments (i.e., to prevent theft or further damage), their location and orientation should first be fully documented (on paper and in photographs). Ideally, these fragments should be documented, stored, and clearly identified, in a safe, dry



Figure 4.1: Signage with cemetery rules at the entrance to the historic Mt. Hope African American Cemetery in Raleigh, North Carolina.
Photographer: Jason Harpe.

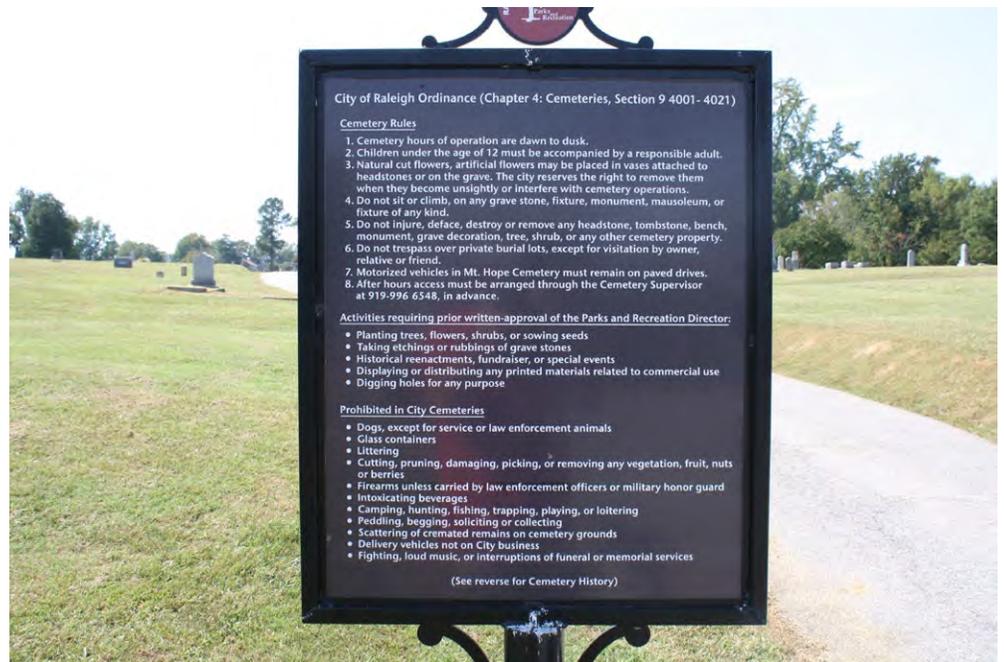


Figure 4.2: Signage with cemetery rules at the entrance to the historic Mt. Hope African American Cemetery in Raleigh, North Carolina.
Photographer: Jason Harpe.

place; however, this is often impractical due to the lack of appropriate storage facilities and/or the large number or size of pieces requiring curation. In these cases, the burial of stone fragments behind their associated standing “parent stone” is acceptable; these should still be fully documented prior to burial. For both on-site burial and off-site curation, documentation should include the location at which the fragment was found, the gravemarker or other landscape feature to which it belongs (by control number, if available; if control numbers have not yet been assigned, identify the source of the fragment by name of the interred [if possible] or by detailed description), orientation, a sketch, and a photograph. No fragments or bricks should be discarded because they will be important for any future stone conservation. If the pieces are to be buried, a sketch map and notes describing the placement of the fragments in relationship to the parent stone must also be included. Unidentifiable fragments, where the parent stone cannot be determined, should be buried at the nearest of a few carefully documented locations.

To bury fragments, dig a hole wide enough that the fragments can lay flat without overlapping or impinging on one another. Although a depth of 10 to 15 inches is recommended (Strangstad 1988), only dig as deep as is necessary to minimize subsurface impacts—about 6 to 8 inches deeper than the thickness of the stone to be buried. Place approximately 2 inches of clean sand in the bottom, and place the stone flat and face-up in the sand. Cover with additional clean sand, and finish filling the hole with the previously excavated soil and sod (Strangstad 1988). If only a small quantity of clean sand is needed, bags of sandbox sand can be purchased at local garden centers; for larger quantities, contact a landscape supply company. This sand will help keep moisture drained away from the stone, as well as providing a visual clue to the presence of fragments when they are recovered in the future.

In clearing vegetation, RGA does not recommend the use of herbicides such as Roundup to eradicate grass around gravemarkers or monuments. The routine use of herbicides such as Roundup is strongly discouraged because of the adverse effects it has on stone. Gravemarkers can wick the salts in herbicides, which causes conditions such as spalling (the formation of a gypsum crust on marble), as well as other types of deterioration (Striegel, Gale, Church, and Deitrich-Smith 2004:6). Dead grass from mowing the grass too close and the use of herbicides also opens the ground up to erosion and weeds.

Clearing should be done with hand-held clippers, with care taken not to accidentally nick or damage stones. Once the bulk of the overgrowth has been removed, string trimmers with light-gauge nylon cord (no heavier than 0.09-inch) can be used in areas where there are no markers or other cemetery features. To prevent damage to burials or other subsurface features, plants should not be pulled out of the ground by their roots. Instead, trim unwanted plants close to the ground and paint the cut stem with an appropriate herbicide. This will limit the amount of herbicide that both individuals and stones are exposed to. In addition, this approach limits the amount of herbicide present in the soils, permitting further plantings (such as ground cover or grass seed) to grow.

Following the above guidelines, site clearing can be done either by a contract landscaper or by supervised volunteers. Regardless of whether paid or volunteer resources are used, it is anticipated that the clearing project will take place over several seasons. To facilitate mapping and recordation, clearing should begin in areas where visibility, even in winter when plant growth is dormant, is limited. This will enable basic mapping to be completed, so that recordation can move forward.

Recordation

This section of the plan consists of projects that will help fully document the cemetery and its burials: a ground-penetrating radar (GPR) survey, updating Thornbury Cemetery’s current cemetery map, data collection, data entry, research, and photographic documentation.

Cemetery recordation includes an inventory of gravemarkers (permanent stones, fieldstones, and temporary markers) and all landscape features. Landscape features include roadways, fences, gates, trees, bushes, statuary, and plot boundary markers. These features are documents of the history

of the site; in addition, they may suggest the location of interments where the gravemarkers have either disappeared or never existed. Researchers have noted that many African American cemeteries purposefully display little or no formal landscaping; “trees and shrubs are generally native to the area, though the use of ornamental vegetation and plantings to mark graves is not uncommon” (MTSU Center for Historic Preservation 2016). This becomes a challenge during site recordation when it becomes necessary to determine if a specific plant has been purposefully placed, or if it is a weed. The only clue to resolving this dilemma may be in the plant’s location. When in doubt, the plant should be recorded.

Gravemarkers at the Thornbury Cemetery include professionally carved stones such as granite and marble and concrete gravemarkers made by family or friends. The cemetery stewards should record all of them. They should record the plot and row markers of marble and granite, as well as concrete curbing, wooden edging, and stonework around family plots. It is also important to record depressions in the cemetery landscape. The lack of grave vaults and subsequent settling of soils at burial locations is typical for African American cemeteries, resulting in depressions that mark the locations of graves that may otherwise be invisible (MTSU Center for Historic Preservation 2016).

Before the cemetery stewards begin recording the cemetery and its features, they should make sure they have the following supplies:

- Inventory forms, online or paper, including extra copies in case of errors
- Clipboard (if using paper)
- Mechanical pencil
- Paper Mate Pink Pearl or Prismacolor Magic Rub erasers
- Notebook
- Digital camera
- Personal care items such as sunscreen, bug spray, poison ivy soap, Benadryl, and first aid kit

Conduct a Ground-Penetrating Radar (GPR) Survey

Ground-penetrating radar has been successfully utilized on historic period archaeological sites, including cemeteries, for several decades in the eastern United States. Geophysical survey methods, including GPR, are non-invasive approaches to identifying and mapping below-surface objects and unmarked graves, and for visualizing the current topography of the ground surface in relation to these underground anomalies (Conyers 2006b). Ground-penetrating radar is effective on historic cemeteries (King et al. 1993). This method of remote sensing allows a glimpse into what may lie underground and can serve as one of many bases from which archaeological excavations can be undertaken. Geophysical survey methods are also used to identify possible prehistoric earthworks and monuments; large, buried soil features (i.e., fortifications and trenches) on battlefield sites; and spatial organization of early historic settlements, trading posts, farmsteads, and tavern sites; among other elements (Cornett and Ernenwein 2020; Ewen 2019; Heckman 2005; Horsley et al. 2014; Kvamme 2003).

The results from GPR and other remote sensing methods do not usually involve the identification of specific features. Identifying potential graves in historic cemeteries does not usually involve the identification of physical human remains (i.e., skeletons) (Lowry 2016), but rather the difference in reflections from pulsed radar energy into the ground from the GPR antenna (Conyers 2006a). As the pulses encounter varying sub-surface features, they are reflected to the GPR unit in varying degrees of strength and transmission time. Thus, changes in soil compaction and chemistry may transmit a contrasting signature from that of the surrounding matrix. For example, when using GPR to delineate cemeteries, usually a grave shaft, casket or coffin, spaces/voids, vaults, or burial goods are detected as

dissimilar from the surrounding natural strata (Lowry 2016). Transmission time is the amount of time it takes for the radar pulse to be reflected to the receiving antenna and is interpreted as depth (i.e., the longer the transmission takes the deeper the object lies).

The objective of the GPR survey is to identify the location of marked graves and potential unmarked burials within the limits of the survey area. A GPR survey can identify subsurface features, such as grave shafts or coffins, without disturbing the ground surface, and provide the location of marked graves and potential unmarked burial anomalies. Field conditions, such as tree roots, debris, and rocks could affect the results of the survey. Contrast in soils is important for detecting subsurface anomalies such as burials. Over time, distinctions in the soil may be diminished. Since contrast in soils is reduced over time, older burials may be difficult to identify though survey without post-processing (Figures 4.3–4.4).

Update the Cemetery Map

The cemetery stewards have a good hand-drawn map of the cemetery that includes the location of burial plots and gravemarkers with a corresponding list of the decedents buried in the cemetery. They should have this map professionally digitized and add to it any gravemarkers, plot enclosures, or landscape features that are missing.

Data Collection

Stewards should complete standardized survey forms like those provided on the cemetery preservation and recordation section of PHMC’s website for each landscape feature. When completing these forms, cemetery stewards and volunteers should not use pens with colored ink; a pencil is preferred, though black ink may also be used. Both pencil and black ink are more archivally stable than colored inks, extending the stability of the original documents. For gravemarkers, the cemetery stewards should record on the survey form the recording date; type of gravemarker (headstone, footstone, family marker, etc.); size of the marker; description of material (marble, granite, concrete, fieldstone, zinc, etc.); condition of the marker; name of the deceased; vital dates (birth and death); description of the carving (motifs and styles); stonecutter and engraver marks; exact inscription; and any other identifying characteristics. This step includes taking a photograph of the gravemarker. Finally, the cemetery stewards should verify the accuracy and completeness of the survey forms while in the field. Volunteers can complete this stage of the recordation process under close supervision by the cemetery stewards or project consultants. It is important that all gravemarkers are completely and accurately recorded. A project coordinator can assign volunteers a particular sequence of gravemarkers to record or a series of completed survey forms to review, to verify that the information is correct. The cemetery stewards or project consultant should provide a short orientation and training session for all volunteers to familiarize them with the terminology on the standardized forms.

Data Entry

Cemetery stewards and volunteers should enter all data collected “on the ground” (including photographs) into a master database or spreadsheet organized by gravestone numbers. This will make the data easily searchable and accessible. Cemetery stewards and volunteers can conduct data entry and field survey simultaneously. No one should discard original survey forms following data entry; instead, they should keep the survey forms in the Thornbury Cemetery archive as both historical documents and as a “paper backup” that is available for re-entry should anything happen to the computer database.

Thornbury Cemetery stewards may wish to create their own database framework using a program such as Microsoft Access or another computer database, or they may wish to use a pre-formatted alternative. Volunteers who are familiar with the database software can perform data entry. Original field survey forms should remain in a centralized location; if someone wishes to do data entry at home, they should work from copies. A project coordinator should ensure that all forms are entered correctly. Volunteers who are doing the data entry should also take part in the short orientation and training session attended by the volunteers working to record the data in the field.



Figure 4.3: Cayla Cannon, RGA's Geophysical Archaeologist, conducting a ground-penetrating radar (GPR) survey at the Kiser-Huffstetler Cemetery in Lincolnton, North Carolina.

Photographer: Jason Harpe.

The rate of data entry varies, depending on the users' familiarity with the computer software, typing speed and accuracy, and the amount of information recorded for a particular marker (a long inscription, for example). A reasonable expectation is five to nine records entered per hour (approximately 7 to 12 minutes each).

It is critical that the paper forms and the database, whether purchased pre-formatted or created, are consistent—each should have the same fields, in the same order, and collect information in the same format (for example, if it is a yes/no checkbox on the paper form, the database entry for that feature should only accept yes or no).

The cemetery stewards may consider using an Excel spreadsheet or Google Sheet to record all gravemarkers and site features until they are able to purchase Microsoft Access or a similar product. Google Sheets is a cloud-based spreadsheet application that can function as a database that stores data in a structured way similar to most database management systems.

Research

Research is one of the most important parts of a cemetery preservation plan and should be conducted throughout the project to support past documentation and uncover new information on the history of the cemetery and its decedents. The dearth of primary materials on African American cemeteries and their decedents can be problematic for researchers, but developing an understanding of the primary materials held in public repositories and the digital records available online will help uncover materials otherwise thought to be non-existent, missing, or destroyed. Researchers can assemble the history of their cemetery and biographical information on the decedents from primary and secondary resources.

Kiser-Huffstetler Cemetery
Crouse, Gaston County, North Carolina
 Ground-penetrating Radar Survey, April 2021

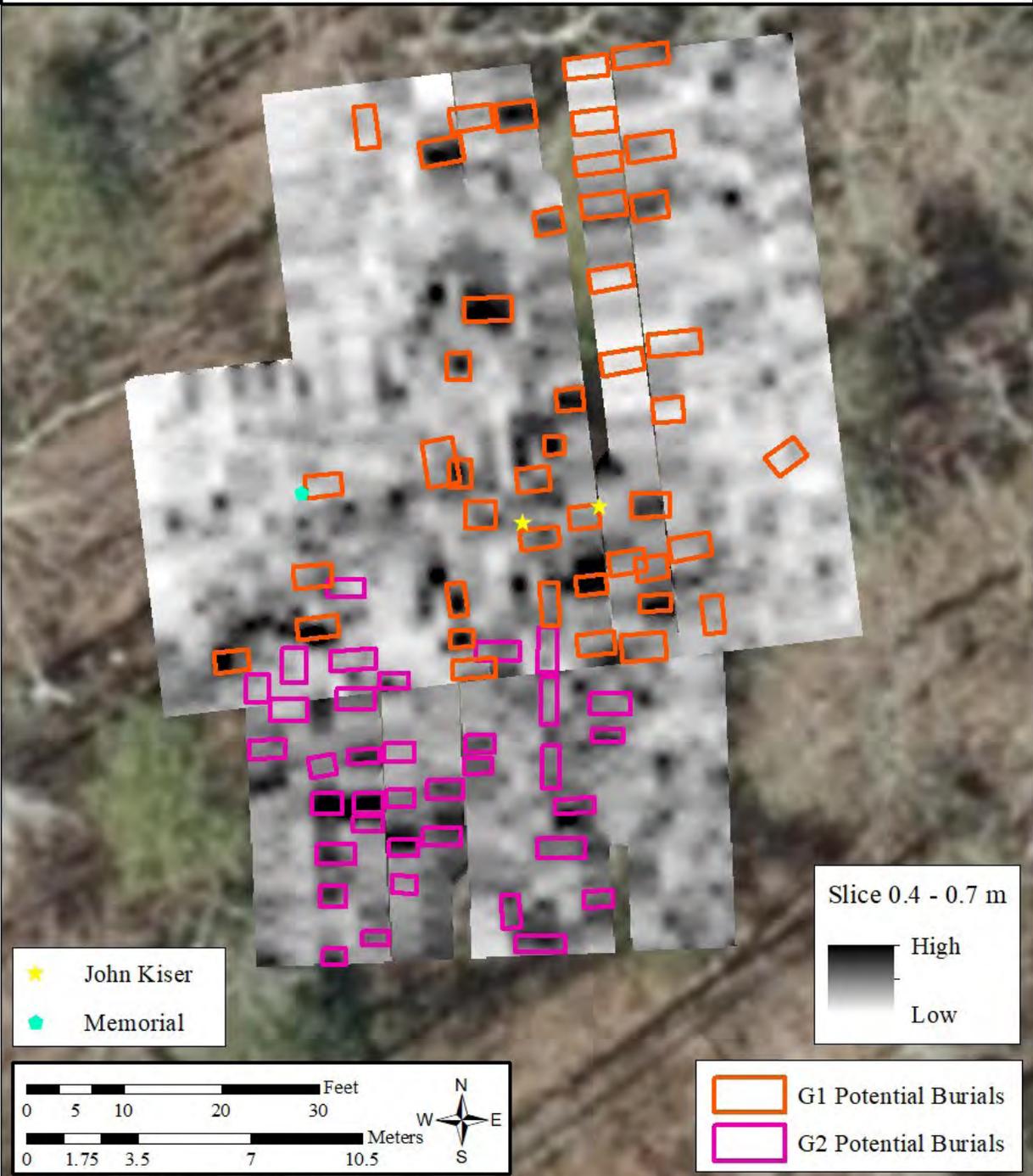


Figure 4.4: A total of 80 potential burials were identified through post-processing during the GPR survey of the Kister-Huffstetler Cemetery. This number includes 44 potential marked and 36 potential unmarked burial anomalies. This graphic shows potential burials in Grids 1 and 2 on a time slice map at 0.4 to 0.7 meters below the surface.

Researchers can find biographical information on their cemetery's decedents at repositories and in sources such as churches, funeral homes, burial associations, and in death certificates. Other sources include newspaper obituaries and other types of death notices, family histories, bibles, diaries, correspondence, probate records, mortality schedules, military service records, tax records, and tabular charts created by genealogists. The cemetery stewards can find research leads from Thornbury Cemetery's page on FindAGrave.com.

The cemetery stewards should research Chester County death certificates and document each person whose death certificate lists Thornbury cemetery as their burial location. They can find digital copies of Pennsylvania death certificates for the years 1906–1972 on PHMC's website (<https://www.phmc.pa.gov/Archives/Research-Online/Pages/Ancestry-PA.aspx>).¹ The stewards can enter all information in the death certificate into a database form or a simple Microsoft Word fillable form like the one in Appendix F. Jason Harpe, RGA's Director of Cemetery Conservation, used this strategy on a previous project that resulted in two printed volumes on African American burials in Lincoln County, North Carolina. Harpe arranged one of the volumes by decedents' last names and the other volume by burial location.

Photographic Documentation

Cemetery stewards, volunteers, and researchers can take photographs of the cemetery, gravemarkers, and landscape features with a high-quality SLR or DSLR digital camera, but people who have a smartphone can capture photographs and video using one or more built-in digital cameras. It is imperative that the stewards and researchers ensure that their smartphone's camera is set to a high resolution, between 5 MBs and 8 MBs. Both Android and iPhone phones allow for changing the resolution of photographs. For smartphone users with the newest generations of the Android operating system, the steps are as simple as opening the camera application, clicking on Settings in the bottom left corner, clicking on Resolutions, and making sure that they have the resolution set at the highest possible quality. iPhone users should go to their Settings, click on Camera, then Formats, and select Most Compatible so they can save the file as a JPEG, which is a more widely compatible format.²

The stewards should choose a file hosting service such as Dropbox (they can download the app to their cellphone) where they can store photographs taken with their cellphone. Dropbox is free up to 2 gigabytes for both iOS and Android. Other photograph storage apps include Google Photos, iCloud, Microsoft OneDrive, and Flickr. Once users store photographs on an application, they should download them to an external hard drive to ensure that they are backed up properly.

The stewards should periodically organize all their digital photographs so that they are easily retrievable. They should take lots of photographs because cellphones have high-capacity internal storage and ample space on their SD card. They should also take photographs of areas around the gravemarkers to help with contextualization. This means stepping back from the gravemarker to capture a burial plot enclosure if it has one, stonemason's or engraver's markers, grave goods, and plantings.³

If the cemetery stewards and volunteers become very serious about photographing gravestones and monuments, they should invest in a good, small powerful flashlight with a high lumen value. They should also buy a good tripod and a reflector. Carry a garden sprayer with you when you plan to take photographs of gravestones and monuments because water applied to the face of the stone can help you read the inscriptions. Use a scale bar and, if you don't have one, just use something like a coffee cup from Starbucks. Do not take photographs of gravemarkers or monuments with people in the background.

1 The Pennsylvania State Archives has a partnership with Ancestry.com to digitize family history records in the State Archives and make them available online.

2 Stewards can find phone-specific instructions online.

3 Grave goods or grave decorations are items such as bottles, shells, spoons, pottery, or personal items placed on a grave to commemorate the lives of the dead, ward off evil spirits, or represent the spirits and satisfy them in the afterlife.

The best photographs are taken straight on so that you capture the entire gravemarker. This may require kneeling or lying on the ground in front of the gravemarker. A good resource for learning how to take better photographs of historic gravemarkers and monuments is the Spade & the Grave blog: <https://spadeandthegrave.com/2020/09/26/photography-of-gravestones-for-a-historic-survey-a-how-to-guide>.

The stewards should contact the Chester County Camera Club (<https://www.ccccameraclub.org>) and invite them to Thornbury Cemetery to take photographs of the gravemarkers and monuments. The camera club could participate in some of the stewards' future programs and celebrations at the cemetery (Figures 4.5–4.8).

Records Management

Creating a Basic Inventory

The cemetery stewards do not currently have materials related to the history of Thornbury Cemetery or records on burials, but there may be some historical materials among their church's congregants. If this is the case, one of the key priorities for the stewards is to create a basic inventory of the amount and type of materials present. This basic document serves as a starting point for future organizational planning and will inform future decisions and approaches to the cemetery's records. This list includes information on the contents of the boxes and storage location.

It is not necessary at this stage to have a Thornbury Cemetery archive organized at a single location (in fact, this process can help in determining the organization of the archives later). When planning, it may be more efficient to inventory and re-house the collection at the same time. Stewards should re-house records in acid-neutral banker boxes with a pH level ranging from 7.1 to 8.1 until they are able to purchase acid-free, archival file boxes. Banker boxes are available through the Staples office supply store, ULINE, and Amazon.

Assign all boxes and containers housing cemetery records a unique identifier. One method is to sequentially number boxes according to their location; for example, if Thornbury AME Church has three boxes and two filing cabinet drawers of documents, unique identifiers can be Thornbury Box 1, Thornbury Box 2, Thornbury Box 3, Thornbury File 1, Thornbury File 2. Label the exterior of each box or container with its unique inventory location information (on cardboard boxes, use a permanent marker on the body of the box, not the lid), being careful not to write on any of the documents. For drawers or other containers that you do not wish to write on, use tie-on tags or stickers.

On a sheet of paper, list the title of each folder found within a specific container (the box list), followed by the date range and type of documents that it contains. For example, "Thornbury Box 1, Folder 1, Financial Records 1986–1995, Receipts." Use title information already present on the folder; if this is not self-explanatory, provide additional information in the "Notes" section. Also include the approximate size of the folder, calculated as its thickness measured in linear feet/linear inches. The stewards should record the total size of the box/container, also in linear feet/linear inches. Information on the physical size of the collection is critical when applying for grants, budgeting for supplies, or for any repository the stewards may approach regarding the donation of the collection. A copy of each box list should be included in its respective box, and a reference copy of the entire inventory should be kept at each location where they store parts of the collection. Each steward should keep a copy of the original master box list.

Storage Conditions

The storage environment of documents is critical for their survival. Paper-based documents and photographs, the most common materials found in archival collections, are highly susceptible to environmental conditions such as high humidity, light exposure, acids and other chemicals, and pests. A considerable amount of information is readily available on these topics. In general, however, ideal

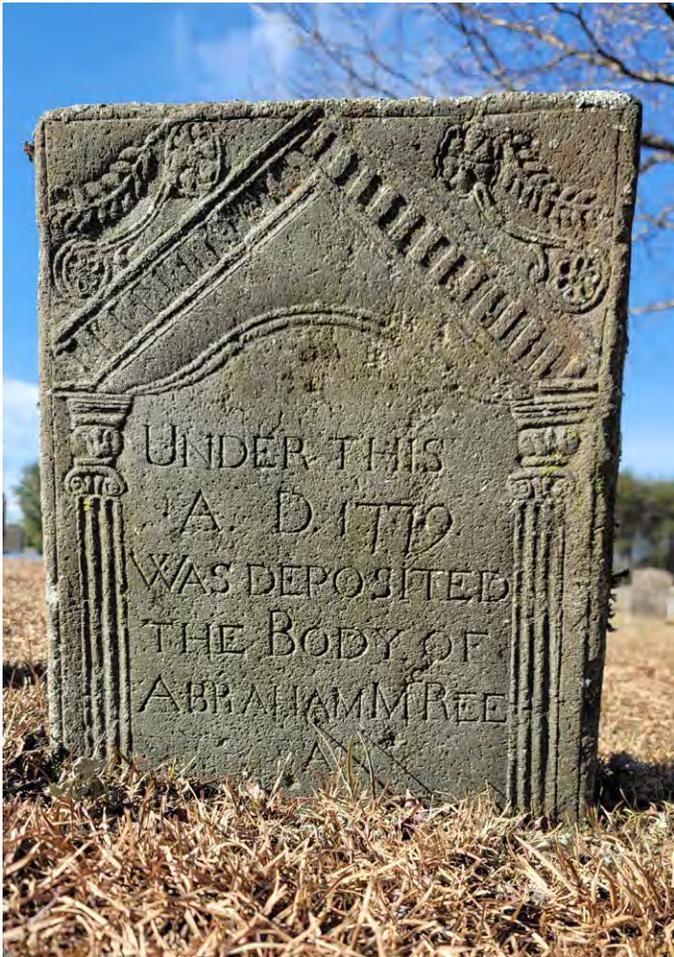


Figure 4.5: Soapstone ground-supported tablet of Abraham Ree (d. 1779), Steele Creek Presbyterian Church, Charlotte, Mecklenburg County, North Carolina.

Photographer: Jason Harpe.

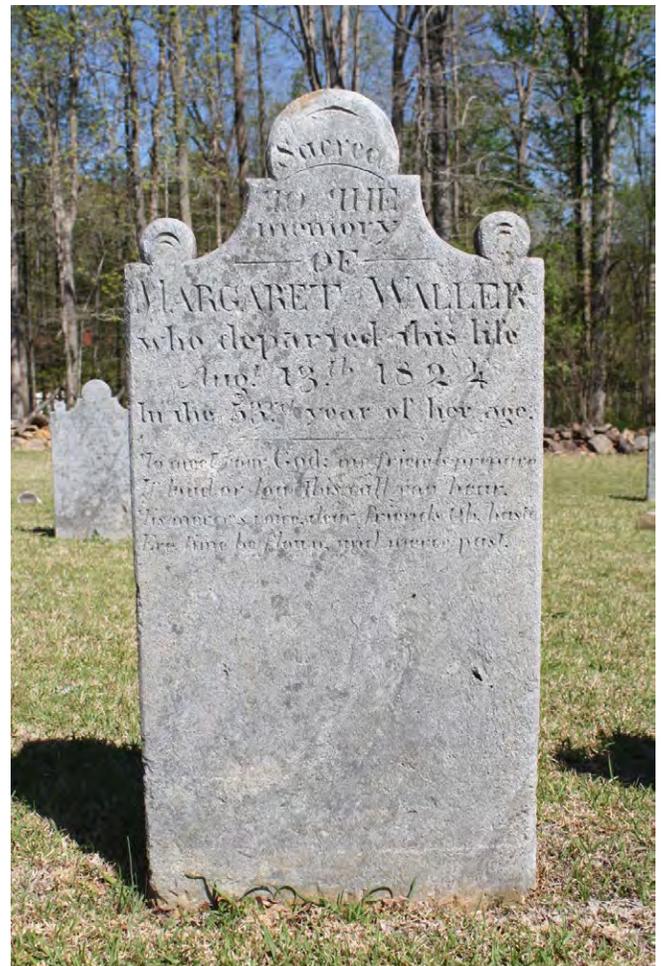


Figure 4.6: Soapstone ground-supported tablet of Margaret Waller (d. 1824), Bethel Presbyterian Church, Clover, York County, South Carolina.

Photographer: Jason Harpe.



Figure 4.7: A granite die-on-base gravemarker for Mattie M. Nolen (1850–1913), Long Creek Presbyterian Church Cemetery, Bessemer City, Gaston County, North Carolina. The photographer lit the gravemarker with a reflector.

Photographer: Jason Harpe.

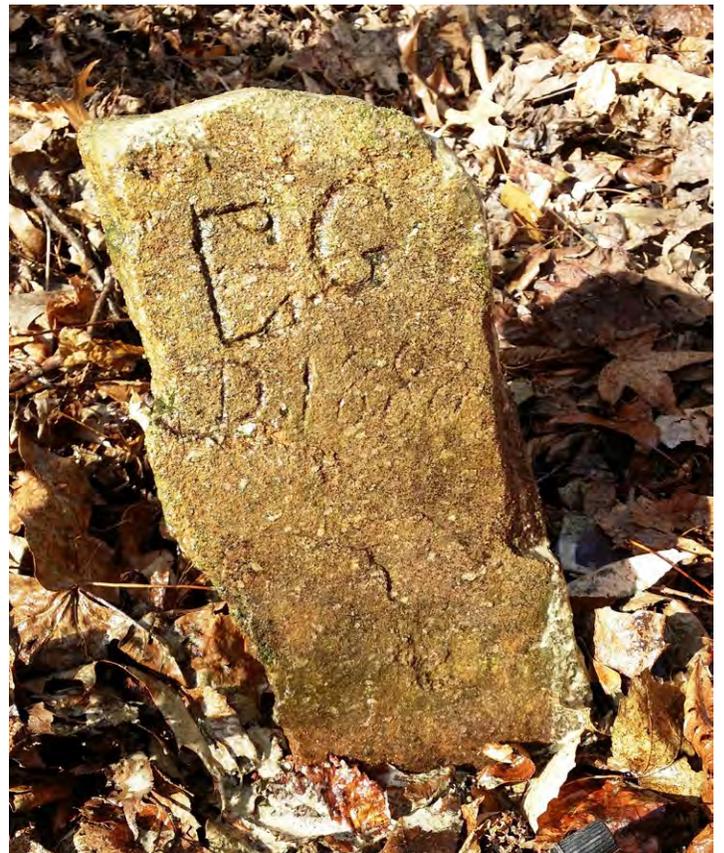


Figure 4.8: A marked fieldstone in a cemetery for enslaved persons that was lit with a reflector.

Photographer: Jason Harpe.

conditions for a mixed archival collection (paper, photographs, video, etc.) include a stable relative humidity of approximately 50 percent, a stable temperature of 65–70°F, low light levels, and storage of like materials with like materials (i.e., photographs with photographs, paper with paper, etc.).

Online sources for additional information on storage conditions:

Smithsonian Institution: <https://siarchives.si.edu/what-we-do/preservation/environment>

Northeast Document Conservation Center: <https://www.nedcc.org/preservation101/session-4/4external-factors>

Library of Congress: <https://www.loc.gov/preservation/care/deterioratebrochure.html>

Notes Regarding Current and Future Files

Thornbury Cemetery is still an active cemetery and will generate new burial records. As the cemetery stewards expand their community outreach and fundraising endeavors, people may come forward and donate copies of documents, photographs, and other materials. The cemetery stewards should encourage these donations and plan for the future growth of the archives.

Organization

Thornbury Cemetery's stewards do not currently have any burial records for the cemetery, but they should consider developing a records management program for materials they may acquire in the future. They should organize the materials (film, paper, photographs) and keep them separated by type. Documents (such as meeting minutes, financial statements, press releases, etc.) should also be filed separately from one another. As the collection grows, the stewards should consider buying archival file folders for their active files.⁴ This will help ensure the stability of the documents. Unbuffered file folders are recommended for general usage and are suitable for both paper documents and photographs. Also, be certain to order file folders, and not sheets of folder stock.

Collections Policy and Deed of Gift

The preparation of a collections policy will help guide the cemetery stewards as they accept items. A successful collections policy and associated Deeds of Gift also establish the legal ownership and copyright status of materials transferred into the stewards' possession. The legal ownership and copyright status of materials in the collection is a consideration for any repository. The collections policy can be a very simple statement of what items the stewards will accept from donors. Cemetery stewards should consider the following questions when considering donations: Will the stewards accept genealogical information on individuals buried at Thornbury Cemetery? What about general family information that is not necessarily specific to individuals interred at Thornbury? Will the stewards accept personal belongings? The policy should require that donors sign a Deed of Gift form, transferring copyright and property rights to the stewards, and the cemetery stewards should be prepared to turn down offered items that do not meet their collections policy. If possible, they should have a list of suitable museums or archives to which they can refer people if they are not interested in accepting the donations.

Basic information about an accession should be recorded as part of a collections policy. This should include a basic description or identification of the records taken in, the date of transfer, and the name of the donor. This summary accession information is often kept as an active list that is added to each time a new item is brought into the collection. Each accession is usually given a unique identifier; one archival standard is to use the year of donation followed by a consecutively assigned number (for example, the first item donated in 2008 has the accession number 2008.001; the second has the accession number 2008.002; etc.). These unique identifiers are then marked on the document being donated (usually lightly and in pencil on the reverse). This unique number also identifies the accession file for the donated item: the accession file contains the Deed of Gift, location information, and any other supporting documents associated with the donation. The stewards can then file the item in an appropriate location. Often, collections of multiple documents given at a single time will be

⁴ Stewards should purchase archival file folders and acid-free boxes from vendors such as Gaylord, University Products, and Talas Online.

kept together; single documents can be interfiled with other documents maintained by the cemetery stewards. Be sure to record the item's location in its accession file; locational control is critical to any successful filing or archival endeavor.

As part of the collections policy, the cemetery stewards may wish to formalize a public access policy for documents in their possession. This policy will detail who can access the Thornbury Cemetery archives.

Community Outreach and Involvement

Community outreach, education, and connections are important parts of the Thornbury Cemetery stewards' preservation efforts. Outreach includes media relations, newsletters, social media, pamphlets, educational materials, programs, and events. In addition to community outreach, these activities also encourage increasing involvement with the cemetery stewards by providing vehicles that inform the public of the various needs associated with Thornbury Cemetery and by giving them different means of becoming involved.

Media Coverage

Media coverage is an excellent, low-cost way to educate and inform people about Thornbury Cemetery, as well as to encourage them to become involved. Press releases can be an effective way to both promote the cemetery and draw attention to events at the site. Press releases should cover "newsworthy" events and announcements, such as spring clean-up announcements, workshops, donation drives, the launching of a new website, fundraising goals, and progress. If a press release is being sent out for an upcoming event, be sure to send it out far enough in advance (two to four weeks) so that the information can be published, and so the media outlet may arrange to have someone present to cover the event if they so choose. If reporters or photographers attend your events, be sure to get their contact information and ask them if you can contact them directly in the future about upcoming events and announcements.

A good strategy to help ensure the most accurate coverage in the media is to make a press kit available to interested reporters. A general press kit regarding the cemetery and the association in general can have supplemental information added to it for any special events. The press kit can be as little as one page in length, and should include a brief history of the cemetery, information about the event being covered, and contact information for the cemetery stewards.

Volunteers

One of Thornbury Cemetery stewards' greatest needs is volunteers. People may not be aware of the cemetery and efforts taking place there, so the stewards must spread the word. They can do this through an online and/or printed announcement, through local community or church groups, and in-person at events. It is important to ask people if they are interested in volunteering with the stewards to help preserve the cemetery. The stewards should maintain a list of projects on which volunteers can work such as cemetery clean-ups, site recordation and data entry, and research. Also, they should have an idea of how much volunteer time each project requires. Some people are able and willing to volunteer a large amount of time, while others are interested in a one-time or more occasional commitment. People may wish to volunteer, but do not know that they have skills that may be helpful to the cemetery stewards.

Website and Social Media

The internet and social media can be powerful tools for community outreach, networking, and education. Advantages to using the internet include the potential to reach a large and targeted audience for relatively low cost. A website is an inexpensive and powerful tool that can be used for public outreach, education, and fundraising.

Currently, Thornbury Cemetery has a website as well as a Facebook page. The website is currently functioning and in good order, but no one has posted on the Facebook page since 2020. RGA encourages the church and cemetery stewards to continue adding material to both the website and Facebook page. Suggestions for the website and Facebook page are included below:

- A history of the site, including photographs.
- Information on how people can contact the cemetery stewards.
- Information for donors, such as a list of items and services for in-kind donations, a donor form and mailing address, online donation links, and information on how the stewards will use the money.
- Donor recognition.
- Information on volunteering at the cemetery, including a contact form for interested volunteers.
- Current news/press releases about the church and cemetery.
- Information on decedents buried at Thornbury Cemetery, including biographies and photographs.
- A research request form for researchers; you can also give information on how long they should wait for a reply and information on any research fees you might charge. You can include a list of genealogical researchers or contact information to genealogy societies for genealogical research, if you decide that is beyond your scope.
- A cemetery map for visitors.
- Educational information and activities for various age groups including lesson plans for teachers.

The cemetery stewards should include the website address in all press releases, letterhead, and on signage posted in the cemetery as a means for people to contact the cemetery stewards to learn more about the cemetery.

The website is very important because it gives the stewards more control over their constituents' and supporters' experiences, and it helps build the stewards' credibility more than a social media presence alone does.

Site Interpretation and Outdoor Signage

RGA encourages the Thornbury Cemetery stewards to write a thorough description and history of Thornbury Cemetery and develop interpretive outdoor signage. The signage could be wood, a cast aluminum highway marker like those made by Sewah Studios of Marietta, Ohio, or signs fabricated by a company like Pannier Graphics in Gibsonia, Pennsylvania (Figure 4.9–4.13).

Fundraising

Fundraising and community involvement are important to the success of Thornbury Cemetery stewards' efforts, and although there is information specific to each presented in this preservation plan, both sections should be considered together.



Figure 4.9: Outdoor interpretative signage at the Madison-Derr Iron Furnace in Lincoln County, North Carolina.
Photographer: Jason Harpe.



Figure 4.10: Outdoor interpretative signage at the Madison-Derr Iron Furnace in Lincoln County, North Carolina.
Photographer: Jason Harpe.

Figure 4.11: Outdoor interpretive signage with benches on the campus of Mars Hill University in Mars Hill, North Carolina.
Photographer: Jason Harpe.



Figure 4.12: Outdoor interpretive signage at Timbuctoo African American Cemetery in Burlington County, New Jersey.
Photographer: Jason Harpe.



Figure 4.13: Outdoor interpretive signage at Timbuctoo African American Cemetery in Burlington County, New Jersey.
Photographer: Jason Harpe.

Identifying Donors and Soliciting Donations

The Thornbury Cemetery stewards could find potential donors from descendants of those interred at the site, residents, cemetery buffs, people interested in African American history in Chester County, local businesses, churches, and civic groups. In addition to a generic donation request letter, the stewards can write letters targeting these specific groups. They can also place requests for donations on cemetery signage, in emails, on the internet, etc. Donor information (including dates of solicitations, amount given, date given, etc.) should be part of the master contacts database maintained by the stewards. They can use this information to target donation requests to people with whom the stewards already have a relationship, and thank donors in a private letter or newsletter, on the website, as part of a press release for an event, and in person at an event.

People who have ancestors buried in the cemetery and visitors to the cemetery are potential donors that can help support the stewards' preservation efforts.

According to Kim Klein, author of *Fundraising for Social Change*, there are 10 important things everyone must know about fundraising.

- 1) If you want money, you have to ask for it.
- 2) Thank before you bank. Once you receive money, you must thank the person who gave it to you.
- 3) Donors are not ATMS. Make them feel like friends and part of your cause instead of contacting them only when you need money.
- 4) Most money comes from people, and most of those people are not rich.

- 5) People have the right to say no.
- 6) To be good at fundraising, cultivate three traits: 1) a belief in the cause for which you are raising money and the ability to maintain that belief during defeats, tedious tasks, and financial insecurity; 2) the ability to have high hopes and low expectations, allowing you to be often pleased but rarely disappointed; 3) faith in the basic goodness of people.
- 7) Fundraising should not be confused with fund chasing, fund squeezing, or fund hoarding.
- 8) Fundraising is an exchange: people pay you to do work they cannot do alone.
- 9) People's anxieties about fundraising stem from their anxieties about money.
- 10) There are four steps to fundraising: plan, plan, plan, and work your plan.

In-Kind Donations

Often, individuals or groups are interested in donating items or services instead of cash. These in-kind donations can be extremely valuable, but only if they are items or services that the cemetery stewards can use. The cemetery stewards should make a list of goods and services that they can use such as trash bags, manila folders, trash cans, pens, clipboards, SD cards for their digital camera, and tools to assist with clearing the cemetery's western section. Stewards should be very clear about how much of each item they need. Revisit the list on a regular basis, considering items and services received and any additional needs that may arise. This list of needed goods and services can then be circulated to potential donors, in a newsletter, via email, or on the cemetery's website and Facebook page. Be sure to include contact information so that potential donors can call ahead and plan.

Grants

There are numerous grant sources available for the preservation and African American cemeteries. These include government and private foundations. One of the keys to accessing grant money is to apply for funding that is a match for your organization and project. While general operating funds may be hard to access through grants, many granting agencies fund specific projects. The availability of grant funds for a project that otherwise was determined to be a low priority may increase its priority level. The stewards should be prepared to re-evaluate the priorities determined for the cemetery based on available resources, including those available through grants.

There are several resources available for organizations to locate grant sources; these are particularly helpful in identifying private foundations that offer grants. One of the most comprehensive databases is managed by the Foundation Directory, but you must have a subscription to access their resources. The stewards of Thornbury Cemetery should consider submitting a grant application to the National Trust for Historic Preservation's Louis J. Appell, Jr. Preservation Fund for Central Pennsylvania. The National Trust accepts applications for grants in the range of \$5,000 to \$15,000 to fund the following types of projects:

- Restoration, rehabilitation, or preservation of historic buildings, including brick-and-mortar construction and repair, as well as costs associated with retaining the services of professionals in the areas of architecture, engineering, preservation, land-use planning, or natural resource conservation.
- Activities related to the conservation of land that contributes to the historic or cultural heritage of Central Pennsylvania.
- Preservation services that directly contribute to the preservation of a specific historic or cultural site including planning, development of promotional/marketing materials, and interpretive or educational programming.

Stewards should research granting agencies on Grants.gov (a database of grants available through the federal government) and funding opportunities with the National Trust for Historic Preservation, the PA Humanities, the PHMC, and the We the People program through the National Endowment for the Humanities.

Special Events

Special events at or about Thornbury Cemetery can serve as a source of fundraising and community outreach and education. Events can include cemetery tours for various age groups, lectures about people interred in the cemetery and various genealogical topics, and candlelight tours featuring people dressed in period attire portraying historical figures interred at the cemetery. The tours can focus on various aspects of the cemetery's history such as military veterans buried at the cemetery; decedents with interesting or unique life stories; funerary art; and unique gravemarker forms and types.⁵ A small fee may be charged to attend these events; other sources of fundraising at these special events include a donation jar or "passing the hat" and refreshment sales.

The Arkansas Historic Preservation Program, an agency of the Department of Arkansas Heritage, has produced a publication entitled "Tales of the Crypt: A Living History Project for the Preservation of Arkansas's Historic Cemeteries" to help guide cemetery organizations through the process of producing one of these living history productions. The guide includes information on structure, research, media relations, funding, promotion, and evaluation. This document is available online at <https://www.arkansasheritage.com/docs/default-source/ahpp-documents/tales.pdf>.

Another good resource for cemetery programming is Rachel Wolgemuth's book *Cemetery Tours and Programming*. Published by the American Association for State and Local History in 2016, the book spotlights cemetery programs that range from basic dog-walking or traditional historic walking tours to diverse programs viewed through the lenses of recreation, education, and reflection.

Maintenance

Maintenance is an important part of managing a cemetery. Currently, the Thornbury Cemetery is in good condition and the stewards should continue their regular scheduled mowing and maintenance schedule with the landscaping company.

Setting Priorities

During the implementation of the maintenance plan, issues beyond the regular lawn care will arise that the cemetery stewards need to address. The safety of the cemetery and its visitors should receive the highest priority. For example, a dead tree threatens the safety of the cemetery (it could fall on headstones causing damage, and the roots could disturb burials) as well as the safety of its visitors. Aesthetics generally warrant a lower priority than safety; however, if something is very easy to accomplish (high impact and high feasibility), such as removing bags of garbage from the site, it can certainly be done sooner.

Inspections

Cemetery stewards should make regular, systematic inspections of the cemetery at least twice per year; however, seasonal inspections (quarterly) are preferred. These inspections will serve to alert the Thornbury Cemetery stewards to any issues that may arise (hopefully before they become emergencies) and enable them to plan future activities based on up-to-date information about the cemetery. Inspections should be done by the cemetery stewards, one of their assignees, or by volunteers who are very familiar with the cemetery. If available, an up-to-date map of the cemetery should be used during inspections to accurately identify problem locations. Cemetery stewards should not delay inspections because they have not yet created a site map; instead, they should use sketch maps and make careful notes regarding the locations of issues that need to be addressed. Lists of stones and other landscape features previously identified as requiring attention should also be brought into the field for reference. A sample inspection checklist is provided in Appendix D.

5 Funerary art is any work of art placed, forming part of, or added to decorate a burial site.

Photographic documentation of general conditions and of specific conditions that require attention (as well as documentation of actions taken) is a vital part of a successful inspection program. Cemetery stewards should take high-resolution photographs and archive them in a database or folder on a computer or external hard drive. They should keep completed inspection checklists and photographs as part of their archive as a record of the cemetery's condition over time.

A regular inspection, including preparation time, time spent physically onsite, and time processing the paperwork and photographs, can be expected to take 8 person hours.

Groundskeeping

Seasonal Clean-up

The cemetery should be cleaned up twice per year; preferably, once in the late spring and once in the late fall. In addition to clearing leaves, branches, and any trimmings from shrubs, etc., garbage and litter should also be removed. If garbage bags are insufficient for the cleanup, a locking dumpster could be rented. To prevent damage to the dumpster and to limit unauthorized dumping, limit the amount of time the dumpster is on-site. It may be preferable to accumulate waste from the clean-up process in a single location prior to the dumpster delivery; this can then be loaded into the dumpster and hauled away in a single day. Seasonal cleanup at Thornbury Cemetery is currently done by the cemetery stewards and volunteer groups.

Mowing

During the field visit to Thornbury Cemetery, RGA staff observed several examples of lawnmower and trimmer damage to gravemarkers, plot markers, and other cemetery features. Several steps can be taken to minimize and prevent this type of damage.

The ideal approach is to mow within 12 inches of gravemarkers and other landscape features and to finish the work using hand shears; however, this is very time consuming and costly. Some cemeteries opt to remove all the grass from around monuments and other features to eliminate the cost of hand trimming, but this creates a landscape that is both artificial and unattractive. This approach also fosters the temptation to apply potentially damaging weed killers and other herbicides to the cleared area (Chicora Foundation, Inc. n.d.; Strangstad 1988).

A more cost-effective and aesthetic solution to minimizing the damage of grounds maintenance includes not using a large mower within one foot of cemetery features, with the remaining vegetation to be cleared using string trimmers fitted with light-gauge nylon filament (not heavy plastic or metal cutting blades) no heavier than 0.09-inch. If the cemetery stewards ever hire a lawn maintenance company for mowing the grounds, the contract should indicate that the company providing the mowing service is responsible for all damage to the cemetery features. RGA encourages the stewards to inspect the grounds during and after mowing to ensure that damage has not occurred.

Cemetery stewards should educate and supervise the landscaping company providing the mowing services and emphasize that the cemetery requires extra care beyond that normally afforded to residential or commercial properties. Grave and plot markers can be very fragile, and plantings are not generally found in planting beds as they are in residential or commercial contexts.

Walk-behind mowers are preferred and are practical for large areas at Thornbury Cemetery where gravemarkers are widely spaced. Riding mowers may be used with care in areas with sufficient room and without low-lying grave or row markers. Push mowers should be used in areas with tightly spaced markers or where low-lying markers and other landscape features such as curbing, plantings, or row markers are present. All mowers should have bumper guards installed for additional protection. These can be as simple as using cable ties to attach pipe insulation foam or pool noodles to the front, back, sides and corners of mowers.

The Thornbury Cemetery stewards are not currently and may never be at a place where aeration and fertilization of the grounds is a consideration. RGA will provide guidelines for aeration and fertilization if the cemetery stewards ever decide to begin a program.

Weeds

Because of the extent of soil disturbance involved and the potential to damage headstones and other cemetery features, rototilling to remove areas of dense weeds is not recommended. In addition, bush hogging or similar approaches to clearing dense vegetation are discouraged due to the potential for damage to gravemarkers, plot markers, and other cemetery features such as intentional plantings.

Individual gravemarkers and burial plots should be kept clean of fresh and dead grass clippings out of respect to decedents and to prevent a microclimate between the stone and clippings where biological growth can spread (Trinkley 2010:22). When intentional and unintentional shrubs are ignored, they become both overgrown and weedy specimens that detract from the cemetery landscape, and it can become difficult to determine what is a shrub and what is a weed. These shrubs could be removed very easily with little instruction and supervision and no ground disturbance.

At some point (when funds are available), cemetery stewards may consider planting perennial low-lying ground cover or clovers from seed instead of grass in portions of the cemetery. These ground covers do not require mowing, which minimizes the cost of landscaping and eliminates the possibility of mower and trimmer damage to the gravemarkers.

Trees and Shrubs

The maintenance of trees and shrubs is an important part of cemetery upkeep. Unmaintained trees can be a liability to both the cemetery and to visitors. A falling branch can cause a lot of damage to a stone; a falling tree, in addition to the damage caused when it falls on something, also pulls up a lot of soil in its roots and causes a great deal of disturbance. Scrub or “weed” trees, as well as those that are directly impacting stones, should be removed and shrubs should be pruned. Trees and shrubs should be visually inspected at least once a year (late spring/early summer is preferable because you can clearly see if a tree is dead). Dead or dying branches should be trimmed to prevent damage to the cemetery. Dead or scrub trees should also be removed by cutting them as close to the ground as possible, and the stumps left in the ground. Use caution or cut them into small pieces starting at the top of the tree to ensure that the felled tree does not cause any damage to existing cemetery features or individuals. Stump pulling or grinding is not recommended because of the amount of subsurface disturbance involved in these practices.

Thornbury Cemetery’s stewards should follow these guidelines when addressing trees in the cemetery:

- Consult with an arborist certified by the International Society of Arboriculture (ISA) to determine if trees can be saved.
- Document the location of trees prior to removal for future replacement.
- It is preferable to use professional tree climbers and hand tools to prune or remove trees. Any necessary vehicles should be of a size to fit narrow paths without damaging grave enclosures.
- Minimize the use of bucket trucks and other heavy machinery, which may damage graves and the roots of healthy trees.
- If work occurs within or adjacent to a burial plot, erect temporary fencing or plywood protective structures over gravemarkers, walls, or plantings that may be vulnerable while tree pruning, or removal work is underway. Protect root zones of adjacent trees from vehicles by covering them with rubber mats or plywood and a thick layer of mulch.
- If the arborist determines that a tree cannot be saved, cut the stump flush with the ground, and allow it to deteriorate naturally.
- Do not grind stumps or remove root balls, unless necessary. Uprooted root masses may be placed in root void and allowed to decay. Topsoil can be added to create a level ground surface.

- Do not use chemicals to accelerate the decay of the root system as the effects of these chemicals on porous gravestones is unknown.
- If removal of uprooted root masses is determined to be necessary, an archaeological monitor should be present.
- For trees at risk of toppling, consult with arborist to determine if the tree can be safely uprighted with a reasonable confidence of survival.
- If the tree cannot be uprighted, cut the stump flush with the ground and allow the root ball to settle back into the ground. Add topsoil and seed as needed.

Replanting Trees

- Replanting trees should be considered in the future. Replace dead or damaged trees with in-kind species when possible.
- Identify open areas free of graves or other structures for planting replacement trees.
- New trees may be planted in the same location as removed trees to minimize soil disturbance. After a period, replacement trees can be planted in the voids created by decaying stumps. Consult an arborist for guidance on ‘stump planting’ and ‘mound planting’ techniques that may be appropriate in a historic cemetery setting.

Cemetery stewards should visit NPS’s webpage on landscapes and vegetation to learn more about how to manage the landscape of Thornbury Cemetery (<https://www.nps.gov/articles/000/cemetery-preservation-course-landscapes-and-vegetation.htm>). Sponsored by the National Center for Historic Preservation Technology and Training, the webpage includes videos on managing cemetery vegetation; removing invasive plants; an overview of herbicides; herbicide application; removing vegetation growing in soil buildup on cemetery hardscapes; removing invasive trees abutting cemetery monuments; and maintaining Japanese lawn grass in cemeteries.

Groundhogs

During fieldwork, RGA observed burrow holes and piles of dirt holes that may be associated with groundhogs/woodchucks (see Figures 2.23–2.24). RGA staff contacted the Penn State Extension – Chester County and inquired about how to create a plan for dealing with groundhogs, and they provided the following websites that the cemetery stewards should consult:

- <https://extension.psu.edu/woodchucks>
- <https://www.pgc.pa.gov/Wildlife/WildlifeSpecies/Pages/default.aspx> Just scroll through the wildlife species list to find “woodchuck.”

If the cemetery stewards still have questions after consulting these websites, they should contact Kim Myers, Penn State Extension – Chester County Office Manager, at mkm78@psu.edu.

Cleaning Gravemarkers

The cleaning of marble, granite, and concrete grave and plot markers can, in most cases, be done by the Thornbury Cemetery stewards and volunteers. Resetting and repairing gravemarkers should only be undertaken after training or by a professional conservator.

Before cleaning each gravemarker, a cemetery steward should inspect the stone to ensure there is no excessive efflorescence, exfoliation, delamination, or sugaring. Cleaning efforts will not result in the further deterioration of the stone or excessive removal of surface material. Gravemarkers with surface instability should not be cleaned, and the stewards should document this in the database they will create for this project.

Cleaning gravemarkers and monuments with water and a soft-bristled brush is the simplest and gentlest method and one that accomplishes the goal of doing no harm. All cleaning should be undertaken with the mildest and least abrasive methods. Mindful of this, there are available commercial products such as Orvus WA Paste and D/2 Biological Solution that conservators have used for years and continue to use today. These two products, as well as others endorsed by conservators, also accomplish the goal of doing no harm. Orvus WA Paste is a non-ionic detergent that is an electrically neutral cleaning agent that neither contains nor contributes to the formation of soluble salts. It provides substantial wetting of the stone surface, facilitates the removal of general soiling, and contains no added chemicals such as perfumes, colorants, and whiteners. The product is sold by companies that sell museum supplies (such as Gaylord Archival) for washing historic textiles, and it has also been recommended for the cleaning of vehicle surfaces in classic cars and for washing horses.

D/2 Biological Solution is non-toxic and biodegradable, is safe for landscape plantings and grass, and removes a broad spectrum of biological deposits. D/2 is also highly effective at removing stains caused by air pollutants. It has been proven to continue removing stains days and weeks after applied. Conservation work will include cleaning/treating stained gravemarkers with Orvus WA Paste and D/2 biological solution to remove atmospheric staining and biological growth, respectively. Once treated, plastic paint scrapers, brushes with Tampico or nylon bristles, and soft toothbrushes can be used to remove staining and biological growth. Wooden craft sticks or skewers can be used to remove atmospheric staining and biological growth in engraved letters, numbers, and iconographic symbols. All cleaning will work up from the base of the marker to prevent streaking.

The purpose of cleaning gravemarkers is not to make them look “like new;” indeed, scrubbing them to the point that they appear new is damaging to the stone, as the protective patina or outer layer of the stone can be removed. Gentle cleaning, however, removes harmful pollutants (like soot and grime) and microorganisms (like lichen, algae, and fungi) that can damage stone, while also revealing details of the carving that may have been obscured. Microorganisms retain moisture, absorb pollutants, and can produce acids that accelerate surface erosion on acid-sensitive stones such as limestone and marble. Cleaning gives the cemetery a cared-for appearance in addition to protecting the markers. The time needed to clean gravemarkers varies depending on several factors, including the type of material used, the condition of the stone, and the amount of detail on the stone. Each gravemarkers will be individually evaluated before cleaning to ensure its soundness and stability. Treating a single stone may require two to three hours to complete or, if heavily stained and/or ornate, may require up to several two-to-three-hour treatments over several days to complete the cleaning.

It has been recommended that gravemarkers should not be cleaned with a brush more than once every three years (Illinois Department of Natural Resources [IDNR] and Illinois Historic Preservation Agency [IHPA] n.d.:10). After the initial cleaning with a biocidal product and brush, D/S Biological Solution or equivalent biocidal product can be applied and allowed to dwell without rinsing as often as once every year (Figures 4.14–4.17).

Summary

The Thornbury Cemetery stewards face several challenges, including those associated with the availability of resources, lack of active volunteers, and site improvements. RGA staff and cemetery stewards have identified specific issues related to these challenges and then prioritized these issues using a system that incorporates the factors of need and feasibility. The purpose of this prioritized preservation plan is to serve as a planning document for the stewards. This document will aid the stewards by addressing their challenges in a manageable manner. This is not a static document; the stewards should re-evaluate their needs and priorities on a regular basis. An overall summary of priority categories and their associated tasks identified in this preservation plan follows. Details regarding the implementation of these tasks can be found in the relevant section of this report.



Figure 4.14: An Eagle Scout project that involved cleaning gravemarkers at the Old White Church Cemetery in Lincolnton, North Carolina.

Photographer: Jason Harpe.



Figure 4.15: Before-and-after photographs of a marble angel in Lincolnton, North Carolina, after being cleaned with D/2 Biological Solution.

Photographer: Jason Harpe.



Figure 4.16: Volunteers participating in a cemetery preservation workshop conducted by Jason Harpe at Christ Lutheran Church in Stanley, North Carolina.
Photographer: Jason Harpe.

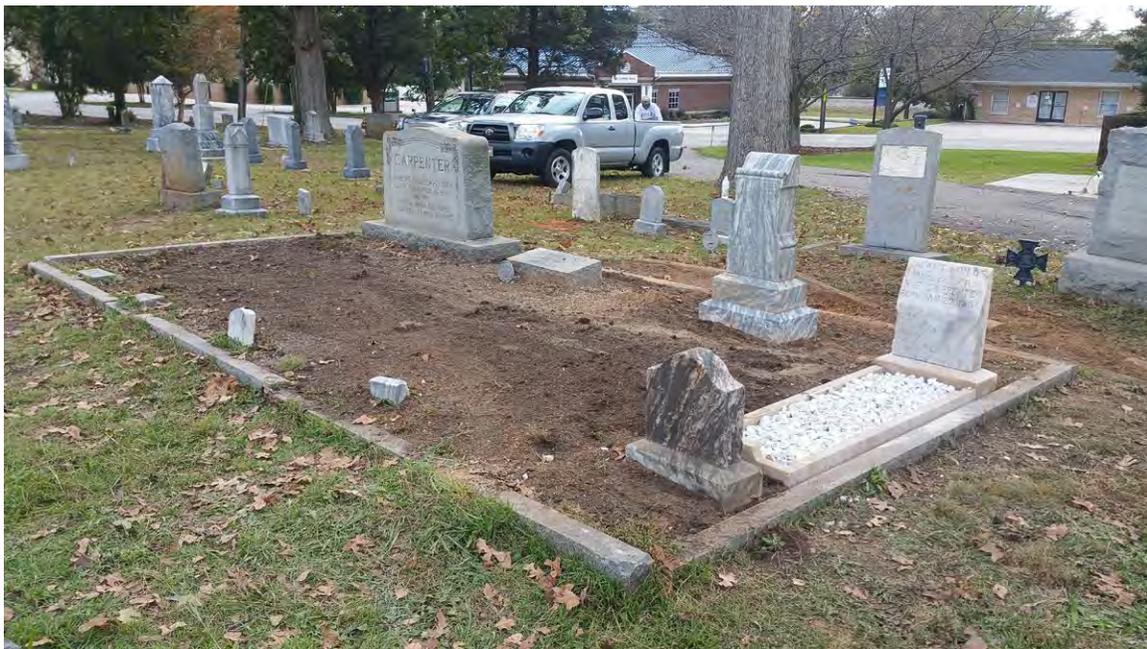


Figure 4.17: A burial plot enclosure and gravemarkers preserved by the volunteers who participated in cemetery preservation workshop conducted by Jason Harpe at Christ Lutheran Church in Stanley, North Carolina.
Photographer: Jason Harpe.

Task: Access and Security Control

- Post signs at near the church's current sign that detail cemetery hours, contact information, and site rules. Notify the local police that hours have been posted.
- Implement vandalism and damage recordation and reporting procedures.

Task: Cemetery Mapping and Site Clearing

- Contact local Boy Scout troops and let them know that Thornbury Cemetery is a suitable candidate for Eagle Scout projects.
- Contact local schools about Thornbury Cemetery because they may have students in organizations such as the National Honor Society who need service hours.
- Contact local clubs and fraternities such as the Lions, Chamber of Commerce, Kiwanis, Rotary, Masons, etc. and appeal to them for help at Thornbury Cemetery.
- Contact local businesses and ask if they would consider donating funds or in-kind materials.
- Contact the local probation office and ask if there are youth offenders who need public service hours that could be devoted to site clearing at the cemetery.
- Contact local garden clubs to determine whether they would join the effort at Thornbury Cemetery.
- Contact local and regional historical and genealogical societies to garner their support for Thornbury Cemetery.
- Attempt to identify and contact the descendants of people interred at Thornbury Cemetery.

Task: Site Recordation

- Map unmarked burials using ground-penetrating radar (GPR).
- Purchase a high-resolution SLR digital camera for documenting gravemarkers, site conditions, incidents of vandalism, and public outreach activities at the cemetery.
- Invite the Chester County Camera Club to Thornbury Cemetery to take photographs of the gravemarkers and share them with the cemetery stewards.
- Map the cemetery, including the locations of gravemarkers and landscape features. Assign numbers to rows and gravemarkers.
- Conduct gravemarker and family plot surveys and conditions assessments using standardized forms.
- Catalog the vegetation and other remaining landscape features using standardized forms.
- Digitize African American death certificates for individuals buried at Thornbury Cemetery and complete a Microsoft Word fillable form for each of the death certificates.
- Contact a branch of the Chester County Public Library system and ask if they provide access to Newspapers.com and Ancestry.com. If the library doesn't offer this service, sign-up for a free 90-day trial or secure a paid account with Newspapers.com and download all obituaries for decedents at Thornbury Cemetery, as well as short posts and full-length articles on the cemetery.

- Register Thornbury Cemetery with the Black Cemetery Network. <https://blackcemeterynetwork.org>
- Use cemetery and marker survey forms provided by the Pennsylvania Historic & Museum Commission's website. <http://www.phmc.state.pa.us/portal/communities/cemetery-preservation/documentation/index.html>

Task: Records Management

- Prepare an inventory of materials currently held by Thornbury AME Church and members of the congregation that pertain to Thornbury Cemetery.
- Store records in a building with appropriate environmental conditions.
- Prepare and implement a collections policy, including a Deed of Gift form, in preparation of donations to the cemetery stewards.

Task: Community Outreach and Involvement

- Prepare a basic press kit.
- Update the Thornbury AME Church website and Thornbury Cemetery Facebook page with updated information about the cemetery's history, plans, hours, location, contact information, etc.
- Start a spreadsheet or database to contain contact information of individuals and organizations with an interest in the cemetery. This database should also include press contacts. Use email, press releases, and targeted mailings to keep the press and others aware of events, etc., taking place at Thornbury Cemetery.
- Prepare a volunteer application form and make it available to those interested in volunteering.
- Contact Volunteer Chesco and tell them about the volunteer opportunities available at Thornbury Cemetery so that they can add the information to the volunteer opportunities on their website. <https://www.chesco.org/2969/Volunteer-Chesco>
- Prepare printed educational materials such as pamphlets and histories.
- Develop a relationship with the local news outlets (print and video) to feature stories on people buried at Thornbury Cemetery.
- Use newspaper articles to appeal to the community for support and make requests to descendants to submit photographs and biographical information on their ancestors buried at Thornbury Cemetery.
- Contact the Pennsylvania Chapter of the Association for Gravestone Studies and invite them to have a meeting at Thornbury Cemetery. https://www.facebook.com/people/The-Pennsylvania-Chapter-of-the-Association-for-Gravestone-Studies/100069484365887/?ref=py_c
- Involve colleges or universities such as Cheyney University in the Thornbury Cemetery project. Professors and students can help with clean-up days and conduct research projects on decedents at the cemetery.⁶

⁶ A project the stewards of Thornbury Cemetery could emulate is the relationship between Duke University and Geer Cemetery in Durham, North Carolina. The stewards of Geer Cemetery have utilized both professors and students in mapping and research that is featured on the Friends of Geer Cemetery's website (<https://friendsofgeercemetery.org>).

- Feature historical information and photographs (if available) on the cemetery's decedents on the website or social media. Visit the Friends of Geer Cemetery's Facebook page and website to learn how they feature decedents buried in their cemetery. <https://friendsofgeercemetery.org>

Task: Fundraising

- Identify potential donors and begin soliciting donations. Keep an up-to-date contacts database with donor information.
- Identify goods and services that would be appropriate “in-kind” donations and make this information available to potential donors.
- Identify sources of grant funds and create a “grant calendar” showing deadlines. Begin a program of applying.
- Contact the manager of the local Walmart and other large stores and inquire about their annual local cash grants that can range from \$250 to \$5,000.
- Apply for a grant from the National Trust for Historic Preservation's Louis J. Appell, Jr. Preservation Fund for Central Pennsylvania.
- Develop an adopt-a-plot program for decedents interred at the cemetery who no longer have descendants tending to the burial plots.
- Develop fundraising events and programs such as candlelight tours.
- Partner with other local organizations on fundraising events so that all organizers can pool their resources.
- Create a GoFundMe page for Thornbury Cemetery.

Task: Maintenance

- Implement the priorities, inspections, depressions, and groundskeeping portions of the maintenance plan.
- Implement the cleaning, resetting, and conservation portions of the maintenance plan.
- Research how to deal with the cemetery's groundhog problem.
- Apply for a grant to hire a conservator to lead a workshop focused on teaching stewards and volunteers how to properly clean and reset gravemarkers in the cemetery.
- Watch webinar: <https://learn.aaslh.org/products/recorded-session-memorializing-african-american-history-cemeteries-monuments-and-markers>
- Watch webinar: <https://learn.aaslh.org/products/recorded-webinar-caring-for-historic-cemeteries>

5.0 VOLUNTEER PROJECTS AND PROJECTS REQUIRING PROFESSIONALS

An important aspect of this pilot program, as detailed in the scope of work, is the identification of work that volunteers can complete and work that requires the expertise of industry professionals.

Volunteer Projects

- Clearing thickets at the cemetery's western and eastern edges.
- Continue recording of gravemarkers, site features, and trees.
- Cleaning of gravemarkers. (Volunteers must follow the instructions for cleaning gravemarkers that are included in this report.)
- Research decedents buried at Thornbury Cemetery.
- Photograph gravemarkers according to recommendations in this report.
- Contact businesses such as Lowe's, Home Depot, or the local Ace Hardware and inquire about the possibility of them donating tools for clearing overgrown weeds; fencing; and a few benches that the cemetery stewards and volunteers can place in various locations throughout the cemetery. These benches may invite local citizens to enjoy your cemetery and treat it with respect.
- Update Thornbury AME Church Facebook page. Add to the page the cemetery's address; stewards' contact information; history of the cemetery; and photographs from past workdays, educational programs, and commemorative events.
- Contact local scout troops about Thornbury Cemetery being a candidate for more Eagle Scout project.
- Contact local clubs and fraternities such as the Lions, Chamber of Commerce, Kiwanis, Rotary, Masons, etc. and appeal to them for help at the cemetery. Ask them to let the cemetery stewards give a presentation on Thornbury Cemetery.
- Contact local garden clubs to determine whether they would join the preservation efforts at the cemetery.
- Make attempts to connect with descendants of decedents buried at Thornbury Cemetery and involve them in preservation efforts at the cemetery.
- Write a press release on Thornbury being selected to participate in this pilot program and share with local news outlets.

Projects Requiring Professionals

- Repair of displaced and damaged gravemarkers.
- Ground-penetrating radar (GPR) survey.
- Fabrication and installation of interpretive signage.
- Tree trimming and tree cutting and removal.

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APPENDIX A: STAFF RESUMES

**YEARS OF EXPERIENCE**

With this firm: 2019-Present

With other firms: 22

EDUCATION

MA 2006
University of North Carolina
at Charlotte
Public History

BA 1996
University of North Carolina
at Charlotte
History

PROFESSIONAL TRAINING

MAS-08 Historic
Preservation Boot Camp
Craftwork Training Center
Limeworks.us, 2022

Campbell Center for Historic
Preservation Studies,
Preservation of Gravestones
and Monuments, Basic and
Advanced Techniques, 2013

Edgecombe Community
College, Preservation Trades
School, 2008

PROFESSIONAL SOCIETIES

Member, American Cultural
Resources Association

Professional Associate,
American Institute of
Conservation

Certified Jahn Mortar
Installer, Cathedral Stone
Products

Member, Association of
Gravestone Studies

Board Member, Preservation
North Carolina

JASON HARPE**PUBLIC HISTORIAN/DIRECTOR OF CEMETERY CONSERVATION (36 CFR 61)****PROFESSIONAL EXPERIENCE SUMMARY:**

Jason Harpe has over twenty years of experience in the field of historic preservation. His experience includes historical research and writing, architectural surveys and analysis, the preparation of National Register of Historic Places nominations and local landmark reports, and facilitating the acquisition, preservation, restoration, and maintenance of historic structures, buildings, cemeteries, and historic sites. Mr. Harpe has worked on cultural resources surveys in accordance with Section 106 of the National Historic Preservation Act and other municipal and state cultural resource regulations. He is also a certified Gravestone and Monument Conservator, Professional Associate of the American Institute for Conservation (AIC) and has prepared conditions assessments for cemeteries and has worked on numerous projects involving the conservation and restoration of gravestones and monuments. His educational and professional experience meet the qualifications set forth in the Secretary of Interior's Standards for an Architectural Historian and Historian [36 CFR 61].

REPRESENTATIVE PROJECT EXPERIENCE

Mt. Olive Cemetery Conditions Assessment, Jackson, Mississippi (2022) (Sponsor: Jackson State University) Prepared a fully illustrated cemetery and gravemarker conditions assessment for this historic African American cemetery located on the campus of Jackson State University. The assessment included maps and photographs, as well as the appearance and condition of each gravemarker and mausoleum. Presented recommended conservation treatment methods for each gravemarker and mausoleum, provided the electronic data sheets and photographs, and provided our cemetery database and the geospatial data.

Zion Evangelical Lutheran Church Cemetery Conservation, Hickory, North Carolina (2022) (Sponsor: Privately funded) Conserved over 200 gravemarkers dating from the late eighteenth century to the early twentieth century. Conservation services included treating all gravestones with D/2 Biological solution, resetting unlevel gravestones, repairing damaged gravestones, and re-attaching components of monuments that had been displaced.

Nantucket Cemeteries Conditions Assessment, Nantucket, Massachusetts (2021-2022) (Sponsor: Town of Nantucket) Prepared a fully illustrated conditions assessment report for five cemeteries on the island of Nantucket, with maps and photographs and organized by cemetery. The report described the appearance and condition of each of the damaged gravemarkers and monuments, presented recommended conservation treatment methods for each gravemarker and monument, and provided the electronic data sheets and photographs. We also provided our cemetery database and the geospatial data.

Derr Family Cemetery Study and Conservation, Denver, North Carolina (2021-2022) (Sponsor: Privately funded) Served as lead on this privately funded project that included research on the Derr Family of Lincoln County, North Carolina, and the development of a context statement on walled family cemeteries in the Catawba Valley region of North Carolina. Conserved 11 gravemarkers in the cemetery, six of which were large box tombs.

National Register of Historic Places Nomination, Oakdale Cemetery, Hendersonville, North Carolina (2014) (Sponsor: City of Hendersonville) Researched, wrote, and submitted a successful National Register of Historic Places nomination for Oakdale Cemetery.

National Register of Historic Places Nomination and Gravestone and Monument Conservation, Shiloh Presbyterian Church Cemetery, Town of Grover, Cleveland County, NC, and Town of Blacksburg, Cherokee County, SC (2011) (Sponsor: Privately funded) Lead on a privately funded project that included reports for the Shiloh Presbyterian Church Cemetery to be listed in the National Register of Historic Places and designated as a local historic landmark. Conserved professionally all the gravestones and monuments in the cemetery.

APPENDIX B: CEMETERY GLOSSARY

Cemetery Glossary

The glossary terms has been taken from the National Register bulletin *Guidelines for Evaluating and Registering Cemeteries and Burial Places*; *A Graveyard Preservation Primer*; The Secretary of the Interior's *Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Historic Landscapes*; *Grave Concerns: A Guide for Conserving Historic Cemeteries*; *Landscapes of Memories: A Guide to Conserving Historic Cemeteries, Repairing Tombstones*; and *Michigan Historic Cemeteries Preservation Guide*.

Altar tomb

a solid, rectangular, raised tomb or grave marker resembling ceremonial altars of classical antiquity and Judeo-Christian ritual.

Artificial stone

a term used to describe various materials also known as art marble, artificial marble, cast stone, and composite stone. Some mixture of stone chips or fragments is generally embedded in a matrix of cement or plaster, and the surface may be ground, polished, molded, or otherwise treated to simulate stone.

Bedding

the manner or direction in which bedding planes (layers, stratification or direction in which a stone is formed) are laid when a stone is in use. Bedding is a condition that is typically seen in sedimentary stones such as sandstone and limestone. Stone monuments have bedding planes that are either horizontal (naturally bedded), vertical and parallel (face bedded), or perpendicular (edgebedded) to the exposed surfaces. Most historic slab grave markers have a bedding that is vertical and parallel to the face; it is easiest to split a stone along the natural bedding planes and turn it upright to create a grave marker.

Bevel marker

a rectangular grave marker, set low to the ground, having straight sides and uppermost, inscribed surface raked at a low angle.

Blistering

Swelling and rupturing of a thin, uniform layer of stone are usually found on sandstone, but also on granite. It is generally caused by salts and/or moisture and can occur either across or parallel to bedding planes.

Block markers

made of granite and the type of marker most used today. Most are made of granite, and age can be determined by the amount of engraving found on the stones. The early twentieth century block markers began with few images, but as time proceeded lasers were used to create individual and elaborate designs of portraits of the deceased and activities that they held dear such as hunting, traveling and other worldly pursuits.

Bluestone

a trade term applied to hard, fine-grained, commonly feldspathic and micaceous sandstone or siltstone of dark greenish to bluish gray color that splits readily along bedding planes to form thin slabs. Commonly used to pave surfaces for pedestrian traffic, this material may occasionally be seen in gravestones.

Box tomb

a grave monument resembling a box, usually about three feet by six feet and two feet by three feet high, making an individual grave, or occasionally a family or other multiple burial. Such structures may be known locally as crypts; burial, however, is generally below ground with construction taking place following burial.

Brownstone

a trade term applied to ferruginous dark brown and reddish-brown sandstone quarried and extensively used for building in the eastern United States during the middle and late nineteenth century. Most later use has been for renovation, repair, or additions to structures in which the stone was originally used. In gravestones, most commonly used as bases, although common in some areas, such as the Connecticut River Valley, for table stones as well.

Burial cache

a place of concealment for burial remains and objects.

Burial mound

a mass of earth, and sometimes stone or timber, erected to protect burial chambers for the dead.

Burial site

a place for disposal of burial remains, including various forms of encasement and platform burials that are not excavated in the ground or enclosed by mounded earth.

Burial vaults

unseen underground brick boxes the size of the deceased. The top, seen as a hump the length of the body, is sometimes covered by plaster or cement. The ends may encase a marker for the deceased. These are much like the modern-day concrete burial vaults. The barrel vault was generally made for the wealthy. It is believed to be an English contribution.

Calcite

a mineral form of calcium carbonate. It is the principal constituent of most limestone.

Carin

a mound of stones marking a burial place.

Cemetery

an area set aside for burial of the dead; in Latin American culture known as campo santo, or holy field.

Cenotaph

a monument, usually of imposing scale, erected to commemorate one whose burial remains are at the separate location; literally empty tomb.

Character-defining feature

a prominent or distinctive aspect, quality, or characteristic of a cultural landscape that contributes significantly to its physical character. Land use patterns, vegetation, furnishings, decorative details and materials may be such features.

Chest marker

a solid, rectangular, raised grave marker resembling a chest or box-like sarcophagus. (1.)

Cinerary urn

a receptacle for cremation remains, or ashes, in the shape of a vase.

Columbarium

a vault or structure for storage of cinerary urns.

Columns

pedestal monuments, once a sign of victory by the Romans (Column of Trajan), are used in cemeteries as a symbol of mortality. Columns were seen as more versatile than an urn or an individual likeness. The base could be used to house the body of the deceased. Most columns found in American cemeteries were erected between 1870 and 1900.

Component landscape

a discrete portion of the landscape, which can be further, subdivided into individual features. The landscape unit may contribute to the significance of a National Register property, such as a farmstead in a rural historic district. In some cases, the landscape unit may be individually eligible for the National Register of Historic Places, such as a rose garden in a large urban park.

Cracks

Narrow fissures or fractures in the stone. Each occurrence should be identified and documented.

Crematorium

a furnace for incineration of the dead; also crematory.

Crumbing

the effects of weather or trapped moisture in a stone. Can appear to be grains of sand eroding from the stone.

Crypt

an enclosure for a casket in a mausoleum or underground chamber, as beneath a church.

Cultural landscape

a geographic area (including both cultural and natural resources and the wildlife or domestic animals therein), associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values. There are four general types of cultural landscapes, not mutually exclusive: historic sites, historic designed landscapes, historic vernacular landscapes, and ethnographic landscapes.

Delamination

condition that occurs when a stone breaks or separates along bedding planes usually resulting in breakage of those areas. This is most prevalent on slate and sandstone.

Displaced

original placement is important if the cemetery chooses to seek listing in the National Register of Historic Places. If the stones have been moved, it is no longer a marker. The displaced stone becomes a memorial since it no longer serves the original purpose. There are different reasons that stones may be rearranged. If the row alignment seems a bit too perfect or if the stones are arranged in an odd pattern, such as a circle, most likely all of the stones in a site have been moved.

Dolomite rock

consisting mainly of magnesium carbonate and calcium carbonate; limestone or marble with much magnesium carbonate in it.

Dolomite limestone

limestone that contains more than ten percent but less than eighty percent of the mineral dolomite.

Efflorescence

Deposits of white salts on the surface of stone. It is an encrustation of soluble salts that could be caused by the use of fertilizers and weed-killers, air or water pollution, use of gray Portland cement in concrete and mortars, and some cleaning compounds. These salt deposits are called "efflorescence" when they occur on

the surface of the stone and “subflorescence” when beneath the surface. Efflorescence is a critical sign that the stone is endangered. Often caused by free alkalis leached from mortar or adjacent concrete.

Epitaph

an inscription on a grave marker identifying and/or commemorating the dead.

Erosion/sugar decay

a fine white, gritty substance that is produced on marble markers. Gradual wearing away of the surface, resulting in rounded, blurred edges, and damage to carved details. Erosion is caused by the natural abrasion of wind and wind-blown particles, and also by dissolution of the surface by acidic rainfall.

Exedra

a permanent open air masonry bench with a high back, usually semicircular in plan, patterned after the porches or alcoves of classical antiquity where philosophical discussions were held; in cemeteries, used as an element of landscape design and as a type of tomb monument.

Exfoliation

the peeling or scaling of stone surfaces caused by chemical or physical weathering.

Face

the visible surface of stone masonry after setting. In gravestones, commonly the carved surface of table stones and slabs.

Fallen

Stones that have fallen are susceptible to accelerated damage and deterioration and should be righted.

Family cemetery

a small private burial place for members of the immediate or extended family; typically found in rural areas, and often, but not always, near a residence; different from a family plot, which is an area reserved for family members within a larger cemetery.

Feature

the smallest element(s) of a landscape that contributes to the significance and that can be the subject of a treatment intervention. Examples include a woodlot, hedge, lawn, specimen plant, alee, house, meadow or open field, fence, wall, earthwork, pond or pool, bollard, orchard, or agricultural terrace.

Fillet

a concave filling-in (e.g., with mortar) of a reentrant angle where two surfaces meet.

Flaking

a term commonly used regarding gravestones to indicate minor delamination of surfaces or otherwise unsound stone, which easily peels off in small sheets or layers.

Flat markers

often made of metal and placed flush with or embedded in the ground. This style of marker is generally found in twentieth century cemeteries. This style became popular with perpetual care sites, for they allow mowing with ease.

Flush marker

a flat, rectangular grave marker set flush with the lawn or surface of the ground.

Footstone

a marker used in the seventeenth and eighteenth century when both a stone at the head and a stone at the foot marked the grave. Footstones are smaller and more simply inscribed than their headstones. If they bear any carving, it is usually only the name or initials of the deceased, perhaps the death date, and sometimes a simple decorative design.

Fragments

Small pieces of broken stone.

French Drain

a trench filled with gravel and topped with sand used for eliminating excess water from low points and other areas with water-saturated soil.

Gneiss

coarse-grained metamorphic rock with discontinuous foliation. When used for building stone, generally classed as trade granite. Most gneiss is dark and composed mainly of quartz, feldspar, mica, and ferromagnesian minerals (iron-magnesium silicates).

Granite

defined geologically as igneous rock with crystals or grains of visible size and consisting mainly of quartz and the sodium or potassium feldspars. In building stone and gravestones, crystalline silicate rock with visible grains. The commercial term includes gneiss and igneous rocks that are not granite in the strictest sense.

Grave

a place or receptacle for burial.

Gravemarker

a sign or marker of a burial place, variously inscribed and decorated in commemoration of the dead.

Grave shelter

a rectangular, roofed structure usually of wood, covering a gravesite, enclosed by boards or slats or supported by poles; in tribal custom used to contain burial offerings and shelter the spirit of the dead; also grave house.

Graveyard

an area set aside for burial of the dead; a common burying ground of a church or community.

Gypsum Crust

Common to marble and limestone. Decay caused by the acidic gases in the air. It is a black crust that, when removed, exposes the softer stone underlayment.

Headstone

an upright stone marker placed at the head of the deceased; usually inscribed with demographic information, epitaphs, or both; sometimes decorated with a carved motif.

Igneous

rocks those formed by change of the molten material called magma to the solid state. The igneous rocks are one of three generic classes of rocks (igneous, sedimentary, and metamorphic). Various igneous rocks, generally termed granite if coarse grained, are used for building stone and gravestones.

Incised carving

engraving that is ornamentation made by cutting into the stone.

In place (in situ)

the original location of a gravestone.

Integrity

the authenticity of a property's historic identity, evinced by the survival of physical characteristics that existed during the property's historic or prehistoric period. The seven qualities of integrity as defined by the National Register Program are location, setting, feeling, association, design, workmanship, and materials.

Interment

a burial; the act of committing the dead to a grave.

Laminated stone

stone consisting of thin sheets; stone built up in layers, such as slate.

Ledger

a large rectangular grave marker usually of stone, set parallel with the ground to cover the grave opening or grave surface.

Limestone

rock of sedimentary origin composed principally of calcite or dolomite or both. Limestone varies greatly in texture and porosity. It is usually white, gray or buff in color. Under normal conditions it weathers to a light silver gray or white depending on the stone variety but is usually darker in color than the bright white of marble. It is commonly used in gravestones and tomb structures.

Lych gate

traditionally, a roofed gateway to a church graveyard under which a funeral casket was placed before burial; also lich gate; commonly, an ornamental cemetery gateway.

Macadam

named after John L. Macadam (1756-1836), Scottish engineer who invented the process of using broken stones for roads.

Marble

geologically a metamorphic rock made up largely of calcite or dolomite. It is formed as a result of the recrystallization of limestone under the intense pressure of geologic processes. As used commercially, the term includes many dense limestones, and some rock dolomites. Numerous minerals may be present in minor to significant amounts in marble, and their presence and distribution account for much of the distinctive appearance that many marbles possess. The color of marble ranges from the brilliant white of calcite to black, blue-gray, red, yellow, and green, depending on the mineral composition. It is the predominant stone for gravestones in the nineteenth century.

Mausoleum

a monumental building or structure for burial of the dead above ground; a "community" mausoleum is one that accommodates a great number of burials.

Memorial

an object whose purpose it is to commemorate a person or an event.

Metal corrosion

deterioration of a metal through a chemical or electrochemical reaction between the metal and oxygen (oxidation) or other substances (acids, salts, water, different metals in contact, and so on). Corrosion is

indicated by formation of the corrosion products (such as, rust on ferrous metals) or by loss of metal (pitting and so on).

Metamorphic rock

rock altered in appearance, density, and crystalline structure, and in some cases mineral composition, by high temperature or high pressure or both. Slate is derived from shale, quartzite from quartz, sandstone and true marble from limestone.

Mica

a group of silicate minerals characterized by nearly perfect basal cleavage (cleavage is the quality of a crystallized substance or rock of splitting along definite planes) causing them to split readily into extremely thin plates. They reflect light, causing a shiny or sparkly appearance. The micas are prominent constituents of metamorphic and igneous rocks. In gravestones, they are often apparent in brownstones.

Military cemetery

a burial ground established for war casualties, veterans, and eligible dependents. Those established by the federal government include national cemeteries, post cemeteries, soldiers' lots, Confederate and Union plots, and American cemeteries in foreign countries. Many states also have established cemeteries for them.

Monolith

a large, vertical stone grave marker having no base or cap.

Monument

a structure or substantial gravemarker erected as a memorial at a place of burial.

Mortuary

a place for preparation of the dead prior to burial or cremation.

Mower Scars

Abrasions caused by grass cutting equipment, usually near the bottom of the stone.

National cemetery

one of 130 burial grounds established by the Congress of the United States since 1862 for interment of armed forces servicemen and women whose last service ended honorably. Presently, the Department of Veterans Affairs maintains 114, the National Park Service (Department of the Interior) administers 14, and the Department of the Army has responsibility for two.

Obelisk

a four-sided, tapering shaft having a pyramidal point; a grave marker type popularized by romantic taste for classical imagery in the nineteenth century.

Peristyle

a colonnade surrounding the exterior of a building, such as a mausoleum, or a range of columns supporting an entablature (a beam) that stands free to define an outdoor alcove or open space.

Potter's field

a place for the burial of indigent or anonymous persons. The term comes from a Biblical reference: Matthew 27:7.

Receiving tomb

a vault where the dead may be held until a final burial place is prepared; also receiving vault.

Relief carving

ornamentation projecting forward from a surface usually shallow or, occasionally in gravestones, deep carving.

Rising damp

moisture carried upward through porous stone by capillary action. Soluble salts in the ground beneath a gravestone may be introduced into a stone through this process. If the salts crystallize within the pores of the stone, the action may cause the surface to break off, known as spalling; if the salts are carried to the surface of the stone and then crystallize on it, efflorescence is formed.

Rostrum

a permanent open-air masonry stage used for memorial services in cemeteries of the modern period, patterned after the platform for public orators used in ancient Rome.

“Rural cemetery”

a burial place characterized by spacious landscaped grounds and romantic commemorative monuments established in a gardenlike setting in the first half of the nineteenth century. Mount Auburn Cemetery (1831) near Boston was the first cemetery developed in this tradition.

Sandstone

sedimentary rock composed of sand-sized grains naturally cemented by mineral material. In most sandstone used for building and gravestones, quartz grains predominate. Sandstone is typically buff, gray, brown, red, purple or pink in color; the latter four colors are commonly called brownstone. Some sources of sandstone in the Midwest and Canada were: Medina varieties in southern Ontario (red-brown, gray or mottled); Ohio sandstone from the Berea beds south of Cleveland (light gray or buff); Ohio Briar Hill sandstone (variegated rusty color); and Michigan Lake Superior sandstone (red).

Sarcophagus

a stone coffin or monumental chamber for a casket.

Scaling

advanced loss of stone, which may vary in depth.

Schist

a metamorphic rock with continuous foliation. It splits along foliation and is occasionally used for gravestones.

Screen memorial

a vertically set gravemarker consisting of a tablet with wing elements resting on a continuous base.

Sedimentary

rock formed from materials deposited as sediments, in the sea, in fresh water, or on the land. The materials are transported to their site of deposition by such forces as running water, wind, or moving ice. They may deposit as fragments or by precipitation from solution. Limestone and sandstone are the sedimentary rocks most used for building and gravestones.

Sepulcher

a burial vault or crypt.

Shale

rock of clay origin, easily split into layers. It is occasionally used for gravestones.

Shelter house

a pavilion or roofed structure, frequently open at the sides, containing seats or benches for the convenience of those seeking a place to rest; erected in rustic and classical styles to beautify a cemetery landscape.

Slant marker

a rectangular grave marker having straight sides and inscribed surface raked at an acute angle.

Slate

a hard, brittle metamorphic rock consisting of clay minerals and characterized by good cleavage (cleavage is the quality of a crystallized substance or rock of splitting along definite planes) that is unrelated to the bedding in the earlier shale or clay from which it formed. It was a popular gravestone material of the eighteenth century, particularly in coastal areas. Many of the best-preserved examples of gravestone art are found in slate, an extremely stable stone.

Soapstone

massive soft rock that contains a high proportion of talc. It is occasionally used in gravestones.

Soiled/stained/discolored

Discoloration of the stone caused by vegetation, fungus, pollution or chemical reaction should be noted and any indication of the cause of staining should be noted. Different stains require different approaches to cleaning.

Soundness

the quality of a stone exhibits no sign of damage.

Spall

occurs when part of the stone flakes or splits away through frost action or pressure. As a noun, a chip or flake of stone.

Stele

an upright stone or commemorative slab commonly inscribed or embellished on one of the broader vertical surfaces; a grave marker type revived from classical antiquity.

Sugaring

granular, sometimes powdery, condition that is characteristic of some stone, particularly fine-grained marbles and limestone. Sugaring indicates gradual surface disintegration.

Surface crusts

hard crusts that develop through movement of moisture towards the surface and outer edges of stone and deposition of dissolved material in those areas. Dark-colored crusts on sandstone result from a chemical reaction of the stone to airborne pollutants and often indicates disintegration of the stone behind the crust.

Table marker or stone

a rectangular grave covering consisting of a horizontal stone slab raised on legs, which sometimes are highly elaborate; also "table stone."

Tablet stone

a stone grave marker consisting of a single piece of stone usually not more than three inches thick and set vertically in the ground; to be distinguished from a table stone or vault.

Tilted/sunken

extent to which a stone is sunken or tilted will determine the priority it will be given for resetting.

Tomb

a burial place for the dead.

Tomb recess

a niche or hollow in a wall that shelters a tomb.

Tympanum

a semicircular (or occasionally triangular) decorated face at the top of a tablet stone.

Vault

a burial chamber, commonly underground.

**APPENDIX C: NATIONAL PARK SERVICE PRESERVATION BRIEF 48:
PRESERVING GRAVE MARKERS IN HISTORIC CEMETERIES**

48 PRESERVATION BRIEFS

Preserving Grave Markers in Historic Cemeteries

Mary F. Striegel, Frances Gale, Jason Church, & Debbie Dietrich-Smith



National Park Service
U.S. Department of the Interior

Technical Preservation Services

Cemeteries found across the country are not only places of burial, but they also provide a vivid record of community history. Whether large or small, well maintained or neglected, historic cemeteries are an important part of our cultural landscape. The vast richness of expression through form, decoration and materials informs our understanding of the individuals buried in historic cemeteries and their cultural significance.

While cemeteries are often considered to be perpetual, their most prominent feature—the grave markers—are not. They weather, naturally decay, often are poorly maintained and repaired and, on occasion, are vandalized (Fig. 1). Grave markers are usually noteworthy not only for their inscriptions but also for their craftsmanship. Exceptional markers are considered works of art.

This Preservation Brief focuses on a single aspect of historic cemetery preservation—providing guidance for owners, property managers, administrators, in-house maintenance staff, volunteers, and others who



Figure 1. Sandstone and slate grave markers in the Ancient Burying Ground in New London, CT, display a variety of weathering conditions. Markers in the cemetery date from the mid-17th to the early 19th centuries. Photo: Jason Church.

are responsible for or are interested in preserving and protecting grave markers. Besides describing grave marker materials and the risk factors that contribute to their decay, the Brief provides guidance for assessing their conditions and discusses maintenance programs and various preservation treatments.

Also identified are a number of excellent references that address materials used in all grave markers, including several other Preservation Briefs (listed in Additional Reading). This Brief highlights particular issues that should be considered with historic grave markers.

Types of Traditional Grave Markers

The great variety in the types of grave markers is a fascinating aspect of the study and appreciation of historic cemeteries. Three broad categories can be used to describe grave markers—(1) single-element, (2) multiple-element, and (3) structures. Single-element grave markers are stone, cast iron, or wood elements that are set in a vertical position or placed as a horizontal slab on the ground (Fig. 2). Early examples of this simplest type of grave markers are field stone and basic wooden or wrought iron crosses, with the name of the deceased person scratched into or engraved on the marker. Often, these rudimentary grave markers are overlooked, significantly deteriorated, or lost. Vertical stone slabs and large stone ledgers laid horizontally over the gravesite are more sophisticated examples of this type.

Multiple-element grave markers are found in a number of different forms (Fig. 3). In the most typical form, a grave marker would consist of two stones—an upper headstone placed on top of a base stone. The upper headstone may be secured in a number of different ways to the base. In the simplest of forms, the upper stone was placed on the base, set in a bed of mortar on top of the base, or joined with pins and mortar. With a “tab-and-



Figure 2. These mid-19th century, single-element stone grave markers in the Grove Cemetery in Bath, NY, are set in a vertical position. Photo: Jason Church.

slot” grave marker, the tabbed upper stone was set in a slotted base. More common today, the upper headstone is secured with a technique that uses small spacers set on the base and a setting compound. This technique or one that uses an epoxy adhesive may be found on older markers where the stones have been reset.



Figure 3. A multi-element grave marker from the early 19th century in the St. Michael’s Cemetery, Pensacola, FL, consists of a vertical element with tabs (left image) into a slotted base (right image). Photo: Fran Gale.

Stacked-base grave markers use multiple bases to increase the height of the monument and provide a stable foundation for upper elements. Tall, four-sided tapered monuments, known as obelisks, are typically placed on stacked bases. Columns or upright pillars have three main parts – a base, shaft, and capital. Multiple-element grave markers may also include figurative or sculptural components. Traditionally, stacked base grave markers were set on lead shims with mortar joints or with lead ribbon along the outer edges.

Grave markers can also be engineered structures. Examples of grave marker structures include masonry arches, box tombs, table tombs, grave shelters, and mausoleums (Fig. 4). The box tomb is a rectangular structure built over the gravesite. The human remains are not located in the box itself as some believe, but rather in the ground beneath the box structure. The table tomb is constructed of a horizontal stone tablet



Figure 4. This sandstone table tomb, located in Cedar Grove Cemetery, New London, CT, is an engineered grave marker structure consisting of a horizontal stone tablet supported by four vertical table “legs” with and a central column,. Photo: Jason Church.

supported by small corner supports or columns. Grave shelters, also called grave houses, can be simple or elaborate wooden structures built over the gravesite. Mausoleums are above-ground buildings with compartments for multiple burials. Engineered structures also include hillside and underground tombs.

Guidelines for Evaluating and Registering Cemeteries and Burial Places, National Register Bulletin 41, provides a concise review of grave marker types.

Materials

Stone, brick, concrete, metal, and wood are the most common materials used for grave markers and for fences and gravesite enclosures in historic cemeteries. This section briefly describes the composition and properties of these diverse materials

Masonry materials

There is a wide variety of masonry materials used in historic cemeteries; some are naturally occurring and others man-made. Although there are notable exceptions, most masonry materials are durable, have high compressive strength, and are resistant to weathering. As grave markers, they typically represent the work of masons and stone carvers.

Stone is a naturally occurring material with a wide range of properties and is available in a variety of colors (Fig. 5). Geologists classify stone according to the way in which it was formed with the three categories being igneous, sedimentary and metamorphic rock. Stone found in cemeteries is predominantly quarried, though the use of field stones is not uncommon. The mineralogy and chemical composition of stones vary. Some are composed primarily of silicate minerals; granites, sandstones, slate, and schist are examples. Other stones contain calcium carbonate with marble and limestone in this group. Mineralogy, chemical composition, and physical structure of the stone influence weathering and



Figure 5. A variety of colors of natural stone are found in historic cemeteries, such as this pink granite marker in the Cedar Grove Cemetery, New London, CT. Photo: Jason Church.

the selection of materials and procedures for its cleaning and protection.

Man-made masonry materials are manufactured from naturally occurring raw materials. For example, the raw materials used to make brick include clay, sand, and shale. During firing, clay minerals and sand melt and come together forming silicates, aluminates, and metallic oxides. The resulting brick material has a hard-fired outer surface with a softer interior.

Concrete is a man-made material composed of cement, sand, gravel, and water. Most concrete produced after 1870 contains Portland cement, another manufactured product. In its plastic or wet state, concrete can be cast or poured. It hardens by hydration, a chemical-curing process. The resulting product has excellent compressive strength, but much lower tensile strength. Reinforcing concrete with steel helps compensate for this limitation.

All masonry materials are porous with an interior network of pores. The porosity of sedimentary rocks such as limestone and sandstone can be as high as 20 percent while the pore volume of granite is very low. Because moisture is a key factor in many deterioration processes, porous masonry materials are more vulnerable to weathering.

Metals

Metals are solid materials that are typically hard, malleable, fusible, ductile, and often shiny when new (Fig. 6). A metal alloy is a mixture or solid solution of two or more metals. Metals are easily worked and can be melted or fused, hammered into thin sheets, or drawn into wires. Different metals have varying physical



Figure 6. Decorative cast-iron grave markers like this late-19th century one in Oakland Cemetery in Shreveport, LA, are produced by heating the iron alloy and casting the liquid metal into a mold. Photo: Jason Church.

and mechanical properties, aesthetics, and weathering characteristics.

Ferrous metals and alloys, including cast iron, wrought iron, and steel, all contain iron. Cast iron also contains carbon and silicon and has a relatively low melting point. When heated to a liquid state, it can be molded into a variety of shapes. Wrought iron is an alloy with low carbon content. Its fibrous inclusions (called slag) are sometimes visible to the naked eye. Unlike cast iron, wrought iron is heated to the point where it becomes soft and then is hammered or “worked” into desired shapes. Most of the wrought and cast iron in historic cemeteries is ornamental rather than structural. While cast iron, steel, and wrought iron all contain iron, steel and wrought iron are more resistant to corrosion. Paint was often applied to ferrous metals to help protect them from corrosion and for decorative purposes. Metal elements were painted in a variety of colors including black, white, and green, among others.

Nonferrous metals and alloys, such as bronze, zinc, and lead, do not contain iron. Bronze contains about 85% copper, 10-15% tin, and sometimes lead. Historic bronze cemetery markers were created by casting processes that involves pouring liquid bronze into a mold. The completed casting is hollow. Bronze work may comprise a single molded component, such as a plaque, or multiple molded components welded or fitted together as with large statuary. Chemical patinas were applied to enhance color, and clear coatings for protection. Cast zinc monuments were popular from 1870 through the early 20th century. Most cast zinc is bluish-gray in color. Although cast zinc is resistant to corrosion, it is a brittle material with a tendency to “creep” or deform, especially when exposed to high outdoor temperatures.

Wood

Wood is a porous organic material composed of tubular cells in a parallel arrangement. The structure and characteristics of these cells determine the wood’s



Figure 7. As shown by this 1877 marker in Silver Terrace Cemetery, Virginia City, NV, exposure to sunlight can damage wood grave markers, making the wood more susceptible to water damage and cracking. Photo: Jason Church.

appearance and influence wood properties. Wood-cell walls and cavities contain moisture. Oven drying reduces the moisture content of wood. After the drying process, the wood continues to expand and contract with changes in moisture content. The loss of water from cell walls causes wood to shrink, sometimes distorting its original shape (Fig. 7).

Hardwoods come from deciduous trees such as oak, maple, and walnut; softwoods from conifers such as pine, cedar, and fir. In general, hardwoods have higher density than softwoods, which makes them more durable materials, and are darker in color. Wood cut at different orientations affects its strength and weathering. As an organic material, wood is also particularly vulnerable to termites, carpenter ants, and other wood-destroying insects and fungi. Paints, coatings, and fungicides such as borates are used to help protect wood from various insect damage and fungal rot.

Other materials

Old cemeteries often include a wide variety of other materials not normally associated with contemporary grave markers, such as ceramics, stained glass, shells, and plastics (Fig. 8). As with masonry, metals, and wood, each has its own chemical and physical properties which affect durability and weathering. These materials



Figure 8. A fired ceramic, this cameo is set in a marble grave marker, located in Elmwood Cemetery, Memphis, TN. Different materials may require different conservation approaches. Photo: Mary Striegel.

present unique challenges and their properties must be understood before establishing appropriate maintenance and repair. Documentation of unusual materials is critical when repair is not possible.

Weathering

All grave marker materials deteriorate when they are exposed to weathering such as sunlight, wind, rain, high and low temperatures, and atmospheric pollutants (Fig. 9). If a marker is composed of several materials, each may have a different weathering rate. Some weathering processes occur very quickly, and others gradually affect the condition of materials. Weathering results in deterioration in a variety of ways. For example, when exposed to rainwater some stones lose surface material while others form harder outer crusts that may detach from the surface.



Figure 9. The limestone and sandstone grave markers in this historic cemetery have different weathering processes. On the left, the limestone shows surface loss in areas exposed to rainwater and gypsum crust formation below. The sandstone marker on the right displays uniform soiling, but surface hardening may be occurring. Photo: Fran Gale.

Granite is a durable grave marker material considered resistant to weathering. It is a compact, hard rock with low porosity, and granite deterioration can be imperceptible for many years. Slate also has low porosity, but its layered structure can result in delamination. Some stones used to make grave markers, like sandstone, limestone and marble, are softer than granite and more porous. These materials are more vulnerable to weathering with deterioration noticeable during the initial years of exposure. With slate and other stones with layered structures, weathering sometimes results in delamination, defined as the separation of layers along bedding planes. Different rates of weathering are related to the chemical composition and physical structure of the material.

Deterioration affects other grave marker materials in different ways. With brick, durability is related to its firing temperature, which influences the brick's compressive strength and absorption. Brick fired at high temperatures has a protective fire skin. The weathering of concrete also is variable, and largely depends on the materials used in its manufacture. For example, Portland cement concrete is generally more resistant to weathering than lime concrete. With wood, grave markers fashioned from heartwood (the dead inner wood) are more durable than those of sapwood (the living exterior wood), and some wood species such as cedar, Osage orange and black locust contain extractives that provide decay resistance.

The term "inherent vice" is used to describe a material with a naturally occurring problem that leads to premature deterioration (Fig. 10). An example of this problem is marble that has cracked due to natural locked-in stresses. Inherent vice also describes grave markers that are composed of incompatible materials, where decay is accelerated in one or both materials because of chemical interactions caused by their close proximity. An example is the galvanic corrosion that occurs when dissimilar metals, such as copper and iron, are in contact and exposed to moisture.

Risk Factors

There are two major categories of risk factors that can impact historic grave markers. The first comprises naturally-occurring deterioration phenomena known as the forces of nature, including weathering. The list of natural risk factors includes climate, biological issues, and natural hazards such as fire and floods. The other category includes the many degradation phenomena that are related to human activities. The results of humans and their actions include pollution, lack of maintenance, inappropriate repairs, arson, and vandalism. While some of the factors related to human activities, such as improper repair, may not be intentional, the results can be just as damaging to grave markers.

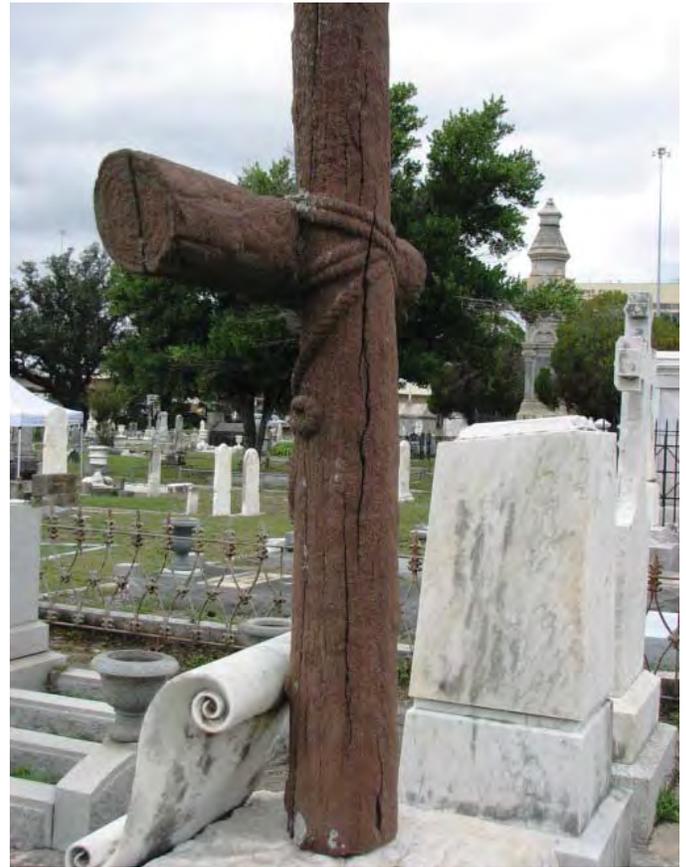


Figure 10. The sandstone cross (carved to look like wood) in this grave marker in St. Michael's Cemetery in Pensacola, FL, provides an example of inherent vice – the severe delamination affecting the sandstone has occurred along its natural bedding planes.

Photo: Fran Gale.

Often, it is not possible to separate natural risk factors from those related to human activities. For example, pollution is deposited on grave markers by rain and other forms of precipitation, resulting in discoloration and often material degradation. Whether due to natural risk factors, human activities or both, "synergism" occurs when the result of two or more risk factors is greater than the sum of the individual effects. An example is the damage that occurs to salt-laden masonry materials during freeze/thaw cycles. The combined effect of these two deterioration factors is severe.

Natural Risk Factors

Climate plays an important role in weathering processes. Depending upon the climate, cemetery grave markers are exposed to rain, snow, sleet, ultraviolet (UV) light, humidity, high and low temperatures, and wind. All of these forces can damage masonry, metals, and wood. For example, with wood, the UV rays present in sunlight accelerate the weathering process.

Exposure to repeated changes in temperature can have an adverse effect on materials such as stone and other porous masonry. High temperatures deteriorate and weaken many materials while low temperatures cause materials to become brittle. In some climates there are rapid changes during spring and fall that



Figure A. Cemeteries are cultural landscapes made up of a variety of features. Grave markers are but one component of cemeteries that also include walkways, drives, fences, coping, trees, shrubs, and other vegetation. Each component adds to the understanding of the cemetery landscape. Photo: Debbie Dietrich Smith.

Vegetation Management

Carefully monitoring and managing of trees and other vegetation is an integral part of a cemetery preventive conservation program. Mature trees and ornamental shrubs can add character, shade, and seasonal color to historic cemeteries (Fig. A). However, if not properly maintained, they can damage grave markers, fencing, and other historic features. Mature trees may fall during storms and drop large limbs that topple grave markers and mangle fencing. Overgrown vegetation creates wet, shaded areas and fosters biological growth that can accelerate deterioration of stone, iron, and wood objects.

A treatment plan for cemetery vegetation should address trees, shrubs, vines, and “volunteer” growth. For the assessment and treatment of trees that pose hazards, consult an International Society of Arboriculture (ISA) certified arborist. Prune trees and shrubs adjacent to grave markers to allow air circulation and light penetration. Certified arborists and master gardeners should carry out this work or direct others in pruning trees and shrubs, as many may be historic features integral to the cultural landscape and worthy of preservation.

Regarding lawn care, historic cemeteries were not designed for today’s large riding lawnmowers, yet this is the mower of choice for many cemeteries, as mowing is one of the most time-consuming and costly maintenance tasks generally undertaken. Mowing between tight spots with a large riding mower deck is destined to cause damage. Best practices include using a smaller, push mower between particularly sensitive features, and outfitting riding mower decks with protective bumpers. Low-cost options include using fire hose padding or a foam swimming ‘noodle’ (Fig. B). Additional damage is caused by riding over low stones or coping, especially when the blade height is set low. If rolling over these features is unavoidable, many riding mowers have a hand-control adjustment to temporarily raise and lower the blade height.

Improper use of a string-trimmer is also potentially destructive, especially when it comes into contact with soft materials such as marble, limestone, and wood. Using the lightest trim line and angling the trimmer head towards the ground will help reduce damage if the trimmer hits unintended targets. Consider hand trimming around the most significant, fragile features.

As a time-saving measure, herbicides are sometimes used around the base of features to remove unwanted grass and weeds. In most cases, use of herbicides for this purpose is not recommended, as salts within the herbicide can wick into the stone (especially soft stones) and cause spalling and deterioration. The removal of vegetation also exposes soil around the base of the grave marker, which, in a heavy rain, can cause soil splashing that may result in staining.

If fertilizer is applied, choose a natural organic fertilizer to minimize salt content for the reasons stated above. For any chemical application, be sure to rinse away residue from grave markers, etc., with water using a low pressure hose or spray bottle, to minimize continued contact.

Ongoing maintenance of cemetery vegetation is essential to conserve grave markers and fencing. Periodic inspections may warrant removing trees; trimming tree limbs, shrubs, and vines; and removing volunteer vegetation. All trees should be inspected at least every five years. Annual inspections are necessary to assess the condition of shrubs and vines, and to identify volunteer growth for removal. Mowing and trimming around the hundreds of stone, brick, iron, and wood features found in many cemeteries is a weekly or bi-weekly chore. Lawn care is the most time-consuming, and, if not done carefully, potentially destructive maintenance activity in historic cemeteries.



Figure B. A pool ‘noodle’ can be fitted to the deck of a lawnmower to prevent damage to grave markers. Photo: Debbie Dietrich Smith.

cause damaging cycles of expansion and contraction. Adjacent dissimilar materials may respond differently to temperature changes, resulting in distortion. High winds can carry water and abrasive particles causing abrasion and erosion, especially to soft materials. Wind may also drive rain water into masonry joints and permeable elements and materials.

Water, in liquid, solid or vapor form, plays a critical role in the deterioration process. Most grave marker materials are porous, and moisture from precipitation, ground water, or frequent landscape watering can enter the pore system. If temperatures drop below the freezing point, water in interior pores, joints and cracks freezes, and its increased volume often applies internal pressure, resulting in damage to the grave marker such as cracks or spalling.

Ferrous metals are particularly vulnerable to water-related deterioration. Iron increases in size when it corrodes, sometimes as much as 20 percent. As the corrosion process proceeds, the ferrous metal eventually weakens. When embedded within concrete or masonry materials, the corroding iron often causes cracks and spalls in the masonry.

Woody vegetation can damage grave markers in a variety of ways (Fig. 11). Trees, bushes, and vines can shade grave markers, extending the time that the markers are exposed to moisture. Tendrils and roots may burrow into mortar joints and openings, causing mechanical damage and large plants may lift up or shift markers. Even leaves and twigs, when allowed to collect on the ground near grave markers, can affect water drainage and evaporation (Fig. 12).

Microorganisms such as algae, fungi, and lichens may affect grave markers. Microorganisms hold in moisture and some produce acids. With acid-sensitive materials such as limestone and marble, the result is surface erosion. Sometimes the organisms use the material as a food source, dissolving minerals in the stone and attacking the cellular structure of wood. Wood is especially vulnerable to fungi, algae, and other microorganisms when its moisture content is above 25%.

Infestation by termites, carpenter bees and ants, and other insects can affect the appearance and structural integrity of wood. Unsightly bird droppings can also affect paint and other surface finishes.

Human Activities

Aside from vandalism and purposeful neglect, most risk factors attributable to human activity are unintentional. Sometimes damage to grave markers is the result of cleaning or repair done with the best of intentions. These unfortunate mistakes can be the result of insufficient training and funding, misuse of tools and equipment, and poor planning. With proper training and supervision, human risk factors can be lessened.



Figure 11. Woody vegetation can damage grave markers and pose a risk to visitors unless well managed and maintained. Photo: Jason Church.

Deferred maintenance usually accelerates the deterioration of grave markers and can be a safety hazard. All materials have a service life with mortar, paints, and other coatings requiring periodic upkeep to be effective. For example, unless ferrous metal has a sound protective coating, exposure to weathering can result in corrosion. Loose, misaligned or detached grave markers may lead to further damage or deterioration if not corrected in a timely manner. When nearby trees and shrubs are overgrown and invasive vegetation is present, needless risks to historic grave markers may also occur.

Inappropriate maintenance activities can be devastating. One of the most common threats stems from improper lawn care, particularly the misuse of mowing equipment and string trimmers (weed whackers). The use of large mowers or mishandling them can lead to displacement of markers. Scrapes, gouges and even breakage also can occur. Improper use of string trimmers in areas immediately adjacent to grave markers can result in



Figure 12. A cemetery professional undertakes a tree inventory in American Cemetery, Natchitoches, LA, to determine the health of trees in the cemetery. Management decisions for trimming or removal are based on the inventory. Photo: Debbie Dietrich Smith.

Avoiding 10 Common Maintenance Mistakes

1. Maintain records on conditions and treatments of historic markers.
2. Seek advice from persons experienced with preserving historic markers when initiating a major maintenance or repair program.
3. Discourage visitor use of chalk, shaving cream, and other materials to highlight carvings and lettering.
4. Train grounds crews in methods to avoid damage to historic markers, including flat grave markers which can be easily damaged by machinery, fertilizers and weed killers.
5. Remove graffiti as quickly as possible, using appropriate methods, so as not to encourage further marker disfiguration and vandalism.
6. Maintain ground cover around cemetery markers to avoid surrounding dirt from splashing back and staining grave markers.
7. Never use rotary grinders to resurface or "clean" historic markers.
8. Avoid the use of coatings on masonry without proper investigation.
9. Avoid high pressure water washing to clean historic markers.
10. Repair rather than replace damaged and deteriorated grave markers. For markers encased in cement, leave any repair work to trained conservators.

scratching and even cutting into softer stone and wood. Generally, the use of chemical weed killers at the base of grave markers should be avoided, especially if there is a risk that the marker would absorb the chemicals.

Repointing masonry grave markers using Portland cement mortars that are harder than historic mortars often results in accelerated deterioration of the masonry material. Mortar should be softer than the adjacent masonry, enabling trapped moisture to migrate out, and serve as the sacrificial material when cracking occurs to relieve excessive stress. Problems also result when using impervious "protective" coatings that can trap moisture within the masonry, resulting in damage during wet/dry and freeze/thaw cycles (Fig. 13).

Figure 13. The impervious coating used to "protect" this sandstone grave marker trapped moisture within the stone, eventually resulting in deterioration and surface loss. Photo: Fran Gale.



Figure 14. High-pressure water washing can damage grave markers. The photograph shows "wand marks" on the headstones produced by inappropriate pressure washing. Photo: Jason Church.



Harsh cleaning products and techniques can have a detrimental effect on grave markers. Acidic cleaners such as muriatic acid can dissolve minerals in many masonry materials and can attack metals. Alkaline cleaners, such as bleach, are notorious for leaving residual salts that are deposited on the surface (a process called efflorescence). Both acidic and alkaline cleaning can result in staining, especially if rinsing is inadequate. Using high-pressure water, above 500 to 1,000 psi, can needlessly damage masonry materials as well, increasing their vulnerability to weathering (Fig. 14). If the marker is fragile, even low pressure water can be damaging. Techniques to avoid include aggregate blasting with sand or other harsh media and the use of power tools with abrasive wire or Nylox™ brushes.

Pollution

Grave markers can be both visually and materially affected by pollution. Most readily apparent is the discoloration that takes place when airborne pollutants are deposited on markers. Depending on the exposure, how water is shed, and the marker material and intricacies, discoloration on markers will usually appear uneven and in streaks.

While the visual effect of pollution is often discoloration, less apparent is the potential damage caused by pollution to the grave marker materials themselves. Most rain is slightly acidic, and its pH (a measurement of acidity) becomes more acidic when pollutant gases, such as sulfur dioxide and nitrous oxides, are present. Acid rain damages materials containing calcium carbonate, such as limestone and marble, resulting in surface loss or erosion. When erosion is severe, the grave marker inscription, carvings and sculptural elements may become discernable. Recarving the inscription is not recommended. Instead, a small stand-alone interpretative sign could be placed nearby.

Acid rain also damages bronze grave markers. Pollutant gases alter the composition of exposed bronze, often producing water-soluble minerals. These minerals are washed away during subsequent rains, resulting in surface erosion. If the bronze element is positioned on a masonry pedestal or plinth, the minerals are deposited on the masonry below. These effects of acid rain are disfiguring to the bronze element and associated masonry.

Condition Assessments

Condition assessments help identify potential safety hazards, required preservation work, and any additional conservation that is needed for stabilization and protection of grave markers. Assessments also provide important baseline information about deterioration affecting grave markers. The collected information is helpful in determining and prioritizing maintenance tasks, identifying unstable conditions that pose an immediate threat, and for developing a plan for any needed repair or conservation work. Assessments should be recurring, preferably every spring. Condition assessments also help determine the extent and severity of damage following a disaster.



Figure 15a. Condition surveys are undertaken to document current conditions, determine safety issues, and plan both emergency stabilization and future treatment plans. There are a variety of survey forms available that can be tailored to the specific cemetery. Photo: Mary Striegel.

Depending upon the size of the cemetery and funding available, the initial assessment may be carried out by a team consisting of cemetery staff, a materials conservator, and, where necessary, an architect or structural engineer for cases involving large monuments and mausoleums (Figs. 15a and 15b). For smaller cemeteries without large monuments and mausoleums, and where funding is problematic, volunteers can be trained to prepare a condition assessment under the guidance of an experienced individual.

The first step in any condition assessment is to gather background information, including cemetery records and documents, historical photographs, records of previous repair and maintenance work, and current practices. The next step is to conduct an on-site survey. Following the survey, recommended maintenance procedures should be provided. If the team or individual conducting the survey is experienced in repairing historic grave markers, their assessment should include information about appropriate materials and techniques for restoration and stabilization.

Survey forms facilitate both recording of field conditions and needed maintenance or repair work. Most forms include sections for marker type (headstone, obelisk, etc.), construction materials, orientation, dimensions, soil type, and grave marker deterioration. There are a number of excellent examples of survey forms available for download, including the National Park Service Condition Survey Form at www.ncptt.nps.gov. However, because each cemetery is unique, it may be necessary to modify an existing form.

A tool kit for the condition assessment may include binoculars, digital camera, magnifying glass, measuring tape, clipboard, carpenter's rule, level, magnet, and flashlight. For large monuments, a ladder or aerial lift may be required. Photographs of each marker, including overall shots and close-up details, are an essential part of the documentation process. Photo logs are helpful for



Figure 15b. Photographs are used to document the condition of the grave marker as part of a condition assessment. Photo: Fran Gale.

recording the date, direction, and photographer. Digital photographs should be captured in a standardized size and format (.tif, .jpg, .raw).

Defining conditions can be challenging, especially for cemetery staff and volunteers who are new to the process. There are a number of illustrated glossaries that can assist with determining accurate terminology for describing conditions. The ICOMOS Illustrated Glossary on Stone Deterioration Patterns <http://www.international.icomos.org/> and the NACE International Resource Center Corrosion 101 <http://nace.org/> are excellent resources.

Where deterioration is apparent, the assessment should address questions such as:

- What are the physical characteristics of the defects? Has deterioration obscured ornamental work or made the inscription difficult to read?
- What is the extent of the affected area? Are all areas of the marker affected by deterioration or is there a pattern?
- Do the conditions appear to be stable or getting worse.
- Are the defects affecting other materials or impacting the safety of visitors?
- Is deterioration contributing to loss or theft?
- Is further investigation required?

Maintenance

The old axiom that an ounce of prevention is worth a pound of cure certainly applies to the preservation of historic cemeteries. Maintenance is essential to the long-term preservation of historic grave markers. The principal components of a maintenance program include regular inspections, cyclical and prioritized maintenance work, and annual reports and budgeting. An important first step is the development of a support team, including staff, conservators, engineers, skilled masons, and other professionals. In most cases, the cemetery manager should initiate this process.

The cemetery manager can use the information from the condition assessment report to develop a maintenance plan with a list of cyclical maintenance work. Many tasks can be carried out by in-house staff. For example, maintenance cleaning of metal and stonework can often be accomplished by rinsing with a garden hose. Applications of wax coatings can be used to protect bronze elements. Trained staff can undertake these tasks. Teaching graffiti removal techniques to cemetery staff may also be necessary if vandalism is an on-going problem. Staff should have access to written procedures



Figure 16. A professional mason works to insert a new piece of stone. Often referred to as a “dutchman”, this repair technique requires replacing the deteriorated stone section with a new finished piece of the same size and material. Photo: Jason Church.

that include lists of appropriate materials and forms for recording the work completed.

Some work is best done by specialists (Fig. 16). For example, unless there is a trained mason on staff, replacing deteriorated or missing mortar will require a skilled masonry contractor. Services of a conservator or trained cemetery specialist should be used for removing severe soiling and staining from grave markers and for carrying out adhesive repair work such as selectively replacing a piece of stone when a marker is damaged by mechanical equipment. Care should be taken to clearly define the scope of work when hiring a contractor. It is useful to reference guidelines and preservation standards, such as those provided by the Secretary of the Interior or the American Institute for Conservation, whenever possible.

Treatments

In historic cemeteries, preservation treatments are used to preserve grave markers and protect them from future deterioration. Tasks such as cleaning, where appropriate, painting, or lime washing may be undertaken both as an initial treatment and on a cyclical basis as part of the maintenance program for the site. Other treatments, including repointing, patching and filling, and resetting, should be undertaken on an as-needed basis.

It is important to note that the Secretary of the Interior’s Standards for Treatment of Historic Properties provide concepts and guidelines for maintaining, repairing, and replacing historic materials. The Standards promote best practices that will help to protect grave markers in historic cemeteries and other irreplaceable cultural resources. If replacement is required, the new material should match the old in composition, design, color, and texture. With chemical and physical treatments, the Standards recommend using the gentlest means possible.

Cleaning

Cleaning is carried out to remove soiling, staining, and contamination from grave markers (Fig. 17). Cleaning improves the visual appearance of the marker and sometimes reveals existing problems such as erosion and cracks. For various protective treatments, cleaning may be a necessary step in surface preparation. Although cleaning often is desirable and beneficial, the use of improper materials and techniques can cause great damage; when cleaning historic grave markers is undertaken, one should keep in mind the principle, “first do no harm.”

To avoid a heavy build-up of soiling that might require aggressive cleaning procedures, regularly scheduled cleaning should be carried out by cemetery staff. The frequency of cleaning depends on a number of factors, including climate, location and vegetation. Before cleaning, an on-site inspection should be conducted to identify monument materials, including those not designated for cleaning since they may inadvertently come in contact with cleaning products and could be harmed. Temporary protective measure may be needed to safeguard nearby grave markers. Identifying the types of soiling present, including pollutants and contaminants, is important in deciding what cleaning procedures to use.

For some monuments, existing conditions may preclude cleaning. Even gentle cleaning may not be recommended for conditions such as severe erosion, advanced deterioration, or fragile areas. Additionally, open joints, unstable repairs, and large cracks may require alternate cleaning procedures.

General maintenance may involve low-pressure water washing. In most cases, surface soiling can be removed with a garden hose using municipal water or domestic



Figure 17. Volunteers can undertake cleaning of grave markers once they have received initial training. Cleaning methods may include wetting the stone, using a mild chemical cleaner, gently agitating the surface with a soft bristle brush, and thoroughly rinsing the marker with clean water. Photo: Jason Church.

Selecting A Conservator or Preservation Professional

A conservator or preservation professional can provide valuable assistance in preserving historic cemeteries by documenting and surveying cemetery conditions, assisting with work plans and prioritizing work, and recommending specific maintenance and repair procedures. More commonly, they recommend more specialized preservation treatments for historic markers and carry out the actual work.

Specialized skills are required for undertaking certain treatments on historic grave markers or where markers are highly significant or are in more advanced states of disrepair. When contracting for grave marker conservation, it is important to interview conservators who have worked in cemeteries. They should be experienced with the historic materials and nature of the conditions where the work is to be undertaken. Prior to selecting a conservator, details about their previous work and training should be obtained and confirmed. Most conservators will provide sample reports and photographs of previous work.

The American Institute for Conservation of Historic and Artistic Works (AIC) offers information about selecting a conservator and what to expect once you have contracted with a conservator. Searching the “Find a Conservator” database provides a list of local and regional AIC members who have attained Professional Associate or Fellow status in the organization. More information can be found on the AIC website at <http://www.conservation-us.org/>

A conservator will inspect grave markers before designing appropriate treatments and submit a written plan for their proposed conservation work that includes materials to be used, a cost estimate, and a schedule for the project. As part of the contract, the conservator should be required to submit a written completion report that clearly describes their treatment of the marker/s and includes maintenance and care recommendations.

water supply from a well. To avoid risks due to freezing, air temperature above 40° F is recommended for the time of treatment and subsequent 24 hours. To help remove stubborn soiling and dirt, soft, natural bristle scrub brushes are best. Avoid metal bristle brushes or firm nylon brushes and wrap metal elements with masking tape to avoid scratching grave markers.

Soaking and/or spraying water in a fine mist are effective methods to remove natural growth. Water also has a “swelling action” for some soiling, making it easier to remove with gentle scrubbing. With cyclic spraying, a fine mist of water is directed at the targeted area for a short time (e.g., 20 minutes or less), followed by a short “off” period. This on/off process is repeated several times. Because high-pressure water can abrade the surface, this treatment is not recommended for masonry monuments.

For stains that are not water soluble or where organic solvents are ineffective, it is sometimes necessary to use chemical cleaning. Chemical cleaners include acids, alkalis, detergents and organic solvents. Each has advantages and disadvantages. Acids dissolve the interface between the stain and substrate while alkalis allow for longer dwell periods but must be neutralized. Some detergents are near-neutral in pH (neither acidic nor alkaline) and easier to rinse.

Before selecting or using a chemical cleaning agent, the manufacturer’s Safety Data Sheet (SDS), available with the product and online, should be reviewed. The SDS provides information about the product’s composition, including identified hazards, proper handling and storage, disposal, and required personal protective equipment. Once a chemical cleaning product has been selected, the manufacturer’s instructions should be followed. Before undertaking large-scale cleaning, it is always advisable to undertake small-scale tests (approximately 6" x 6" areas in discrete locations), and then waiting several days before assessing the results.

Chemical cleaning is used to remove metallic stains and other contaminants such as old coatings and graffiti. For severe staining, poultice cleaning is useful as it extends contact time with the cleaner. A poultice is a mixture of clay or other inert material, such as paper pulp, and a cleaning agent. The mixture is applied to the surface and allowed an extended dwell period. The chemical cleaner dissolves the stain and the clay draws the stain out to the surface. When using a poultice, it should be applied just beyond the stained area and covered with polyethylene. The best practice is to leave the treatment on the surface for 24 hours and then remove the polyethylene cover and allow the poultice to continue drying. Once the poultice is dry, the mixture is then collected and the surface is thoroughly rinsed. For some stubborn stains, the application may need to be repeated.

Chemical cleaning also may be required if biological growth (algae, fungi and lichen) is severe. A study conducted by the National Park Service provides guidelines for cleaning government-issued marble headstones and recommends biocidal cleaners that contain quaternary ammonium compounds. Like all cleaning methods, chemical cleaning can accelerate deterioration. Adverse effects include efflorescence, stains, and etching.

Graffiti Removal

Markers with graffiti tend to be targets for further vandalism (Fig. 18). Timely removal helps deter future vandalism and improves the marker’s appearance.

If the graffiti is water soluble, it can be removed using water and a soft cloth or towel. Rinsing the cloth frequently helps to avoid smearing graffiti on unaffected areas. If the graffiti is not water soluble, organic solvents or commercial graffiti removal products suitable for the grave marker material are recommended. Products should be tested prior to use. General cleaning of the entire marker is a good follow-up for a more even appearance. For deep-seated graffiti, poultice cleaning (previously described) may be required to extract staining materials.



Figure 18. Graffiti is carefully removed using a low-pressure dry-ice misting instrument. Photo: Jason Church.

Repointing

Missing and deteriorated mortar in old cemetery grave markers is a common condition, and the mortar should be replaced to prevent water intrusion and potential damage (Fig. 19). Several questions should be considered when selecting materials for repointing.



Figure 19. Masonry markers like this box tomb may require the repointing of mortar joints. It is important to use a mortar that is softer than the historic brick. In this case a conservator uses a lime putty-based mortar to repoint. Photo: Jason Church.

Most importantly, what is the masonry substrate that requires repointing? What mortar mix is suitable for the historic masonry? How quickly will mortar need to cure? Soft mortars contain traditional lime putty or modern hydrated lime. Harder mortars contain natural or Portland cement. If necessary, mortars can be tinted with alkali-stable pigments to match historic mortar colors. The selection of the mortar to be used is critically important to the success of the project. An inappropriate mortar can result in unattractive work and accelerate the deterioration of the historic grave marker. Always avoid the use of bathtub caulk and silicone sealants for repointing mortar joints.

Prior to repointing, any loose and deteriorated mortar needs to be removed from the joint, preferably using hand tools. Following joint preparation, the mortar materials (lime, cement, and sand) are mixed, and then water added to form a stiff paste. The repointing mortar is applied using a tuck pointing trowel, typically with a narrow 1/8"- 1/2" flat blade. Mortar is compacted into the joint, and then excess mortar is removed and the original joint profile replicated. Good repointing requires skill. Generally, a mason or person with masonry training should repoint mortar joints.

Resetting

Resetting is recommended for grave markers when their foundations are unstable or out of plumb (Figs. 20a through 20c). This often complex activity involves lifting the grave marker, leveling its foundation, and returning the marker to its original upright position. Workers can be injured and the grave marker damaged if resetting is not carried out properly and safely.

Inexperienced staff or volunteers should not attempt resetting without training from a conservator, engineer, or other preservation professional. When dealing with fragile or significant grave markers, or those with large

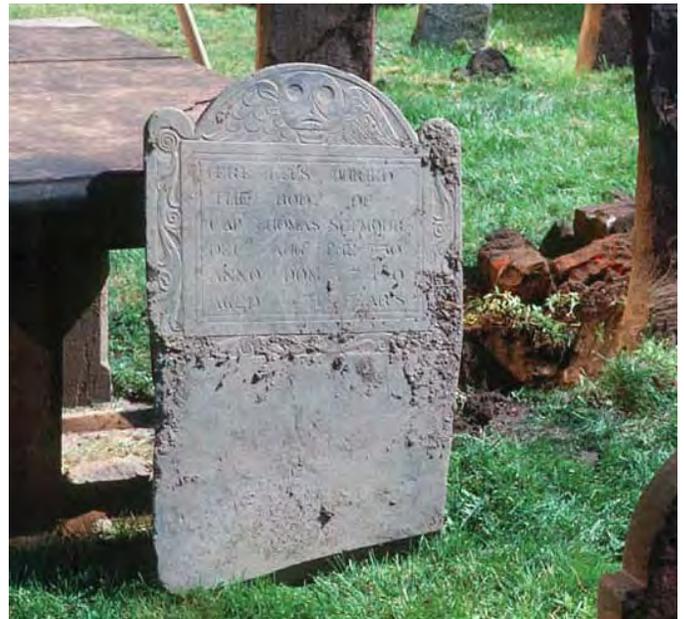


Figure 20a. This slate grave marker in the Ancient Burying Ground in Hartford, CT, is a ground-support stone. Resetting requires digging a hole that will hold the base of the stone and then compacting the soil at the bottom of the hole by hand. Photo: Fran Gale.



Figure 20b. To facilitate drainage, crushed stone, gravel, and sharp sand line the hole and are hand-tamped around the stone after placement. Photo: Fran Gale.



Figure 20c. The reset ground-supported grave marker should be level and plumb. Photo: Fran Gale.

Safety

Encouraging the public to visit and explore public burial grounds and cemeteries increases awareness of the value of these sacred sites. If visitation is promoted, owners and property managers must be responsible for ensuring that their sites are safe for staff and visitors. This responsibility includes monitoring the condition of grave markers.

Historic cemeteries can be hazardous workplaces for staff members, consultants, contractors, and volunteers. Awareness of potential hazards in a historic cemetery and careful planning are essential to avoiding injury. Maintain an appropriate first aid kit on site for minor injuries and have an emergency plan in place that includes contact information for medical assistance.

Creating a safe work environment in historic cemeteries requires appropriate planning for each project, starting with personal protective equipment. Suitable clothing and personal protective equipment should be fundamental safety requirements. Supportive shoes such as steel toe work boots or sturdy lace-up shoes help protect ankles and feet from injury, just as good work gloves help protect hands from cuts, scrapes, and splinters. Whether using a chipper, drill and other power tools or equipment, safety glasses or goggles are essential. A back brace often is recommended for heavier lifting tasks. Do not work alone or, if you must, tell someone where you are and when you expect to return.

During hot weather, heat stress is a present risk. Besides knowing the signs of heat stress, preventive measures should be taken by each worker:

- Wear light, loose-fitting, breathable clothing and a broad-brimmed hat.
- Use sunscreen, reapplying as needed.
- Take frequent breaks in the shade.
- Make sure fresh water is available and drink to stay hydrated.
- Eat small meals before and during work.
- Avoid caffeine, alcohol, and large amounts of sugar.

Trip and falling hazards include uneven ground, holes, open graves, toppled grave markers, fallen tree limbs, and other debris (Fig. C). Sitting, climbing, or standing on a grave marker should be avoided since the additional weight may cause



Figure C. Gophers and other burrowing animals produce uneven ground and holes that are trip and falling hazards to visitors and staff of historic cemeteries. Photo: Jason Church.

deteriorated and structurally unstable monuments to break or collapse with serious injury potentially occurring to the worker and damage to the marker. To help prevent injuries that can result from unstable grave markers, it is important to routinely identify and flag severely damaged and unstable grave markers for corrective work and to rope off any marker considered to be in immediate danger of collapse. Prior to beginning work, the immediate area around the job site should be rechecked for safety hazards.

Snakes, wasps, and burrowing animals inhabit historic cemeteries (Fig. D). Snakes sun on warm stones and hide in holes and ledges, so it is important to be able to identify local venomous snakes. An appropriate venomous snake management plan should be in place, and



Figure D. Yellow jackets that are nesting below the projecting molding of this grave marker pose a hazard to visitors and staff because, if disturbed, they will vigorously defend their nest. Yellow jacket, paper wasp and hornet nests should be removed from grave markers by trained staff or specialists. Photo: Jason Church.

all workers should be familiar with it. Workers and volunteers should be instructed as to safety measures to be taken in regards to snakes, including proper clothing where there is an identified risk.

The imported red fire ant is an invasive pest, prevalent in the southern United States. They attack en masse, resulting in painful bites that can be potentially life threatening to people with allergic reactions. It is important to be able to identify the presence of red imported fire ants; be informed as to safety measures to take when working in areas known to be infested with them; and take steps to control them as necessary. A rescue medicine is available for those with serious allergic reactions.

Paper wasps, yellow jackets, and hornets are another concern, building nests around and on ledges and lips of box tombs, mausoleums, and other grave markers. They are very territorial around their nests and will vigorously defend them. There are non-toxic sprays that can be used in and around the work area. Nests should be safely removed.

Burrowing animals like armadillos, groundhogs, gophers, and moles disrupt the ground with their digging and tunnels and can create tripping hazards or undermine grave markers. Prairie dogs have been known to dig up bones and destroy gravesites. Sinkholes created by these animals can also be perfect places for other creatures like snakes to inhabit.

Proper work practices and lifting techniques need to be used whenever lifting or resetting grave markers. Many markers are surprisingly heavy. For example, a common upright marble headstone measuring 42" long, 13" wide, and 4" deep weighs over 200 pounds. Volunteers and workers should work in pairs, be able bodied, and have training in safe



Figure E1. The simple wooden clamp system allows two people to safely lift a marble grave marker. Photo: Sarah Jackson.



Figure E2. The clamp system is constructed from off-the-shelf wooden boards. Photo: Sarah Jackson.

lifting techniques. Lift equipment and ergonomically correct tools should be routinely used to lift heavy markers (for most people this includes markers that weight more than 50 pounds). For smaller grave markers, a simple wooden clamp system can be constructed for a two-person lift (Figs. E1 and E2).

stacked bases, a specialist should be contracted for resetting.

It is important to check state and local regulations to make sure that digging around the grave marker is authorized before starting any resetting effort. Also, grave markers should be documented and cleaned before resetting. It is also a good time to measure and record the overall size of the marker and note any stone carver's marks or inscription of the company that made the marker. The company name is often found on buried portions of the base and revealed during the resetting process.

Typical materials required for resetting include a hoist, shovels, plumb lines, levels, tamping devices, wooden

stakes, and boards. To improve drainage, sand and small gravel or small stones are commonly used when resetting.

Prior to resetting, it is important to establish the type of base. Most grave markers have one of three main base types: (1) ground supported, (2) slotted base, or (3) stacked base. Similar tasks are undertaken for each base type.

Ground-supported stones are a common type of historic grave marker. This type includes the traditional New England slate and brownstone markers and government-issued marble headstones. The primary goal with any ground-supported marker is to have it level and plumb. To reset the marker, a few inches or more of soil is

first removed from around the stone. This is usually sufficient to enable a stone marker to be straightened. The enlarged hole is then filled and compacted around the marker.

If a grave marker has fallen over and has been covered with soil or turf, it must first be inspected for attached concrete or other anchoring system. If this system is still attached, the grave marker may break during lifting. After removing the stone, it can be cleaned and then temporarily set on wood supports.

The hole left from removal of the marker will need to be enlarged to hold the base of the stone. Soil at the bottom of the hole should be compacted by hand, not with a power tamper. In most cemeteries, crushed stone or sharp pea-size gravel mixed with angular sand can be used to line the hole and then hand-tamped around the stone after it is placed in the hole. The gravel helps facilitate drainage and keeps the stone from settling. A bubble level can be used to ensure that the stone is plumb. Markers should not be set in concrete.

The second type of monument base is the slotted base where the upright element is secured to the base using mortise-and-tenon style construction. The upright element in the slotted base may be leaning or loose. In any case, the upright element should be removed from the base, the base leveled, then the element returned to the base. It is important to keep in mind the depth that the base was intended to be set into the ground. This may be indicated by the style of the base or the observed soil-line staining. Many bases were intended to sit flush on grade while some were set a few inches below ground.

Prior to resetting, the upright element should be disengaged from the base and carefully set aside. In most cases, the base will need to be removed to properly prepare the hole before resetting the grave marker. After doing so, four to six inches of soil should be removed from the hole and the soil then tamped by hand to make a proper bed or foundation. The foundation area can be filled with crushed stone or sharp pea-sized gravel and sand, checking to make sure that the base is plumb and level as resetting proceeds. Clean the headstone prior to resetting. Old mortar, concrete or epoxy should be removed from the slot and the bottom of the upright element using a hammer and small chisel. Once the stone elements are cleaned and the base is level and plumb, the next step is placing the upright element into the slot. A lime mortar can be used to fill any gaps in the slot. This prevents water intrusion that may cause marker movement related to freeze-thaw cycles.

A third common base type is the stacked base. This style includes at least one element placed on a base or a series of bases of varying sizes. Resetting a stacked-base grave marker usually requires special skills and lifting equipment. Depending upon the complexity of the marker, a conservator, experienced masonry contractor,

or preservation professional with engineering skills is usually needed.

The sections of a stacked-base grave marker often are pinned together for support. If deteriorated, the pins should be replaced. Using a hammer and chisel, a conservator or person experienced in working with historic grave markers should remove any corroded iron, copper, or bronze pins, as well as the old mortar or adhesive adhered to each section. Replacement pins should be stainless steel all-thread, and sized slightly shorter and smaller than the existing hole. The replacement pins then can be set with epoxy, lime mortar, or packed in lead. Once the pins are in place, the sections of the stacked base can be individually reset using traditional or contemporary materials. These include lead, shims, mortars, and setting compounds. Finally, each gap or seam between sections should be pointed with a setting compound or appropriate mortar to prevent water intrusion.

Filling and Patching

Hairline masonry cracks may be the result of natural weathering and require no immediate treatment except to be photographed and recorded. However, larger cracks often merit further attention. Repairing masonry cracks involves several steps and typically a skilled hand (Fig. 21). The repair begins with the removal of loose material and cleaning. Materials that are used for crack repair include grouts for small cracks and epoxy for large cracks affecting the structural integrity of the monument. Gravity or pressure injection is used to apply grout or epoxy. Crack repair can be messy, so careful planning and experience are helpful. If the crack is active, a change in size of the crack will be noted over time. Active cracks require further investigation to ascertain the cause of the changes, such as differential settlement, and to correct, if possible, the cause prior to repairing the crack.



Figure 21. Cracks in a stone marker should be filled to keep water and debris out and prevent the crack from becoming larger. A patching mortar is designed to be used, in this case, with historic marble. Photo: Mary Striegel.

Repairing masonry markers with severely damaged or missing pieces requires a skilled mason or conservator. The materials used for patching are similar to those used for repointing mortar joints. With patching, it is critical that the physical and mechanical properties of the patching material be appropriate for the masonry material. Work includes designing a durable patch compatible with the substrate. Proper curing is especially critical for large patches and often involves procedures to protect the patch from premature drying. Repairs to stucco-covered surface should be carried out by a skilled plasterer using a stucco mix that is compatible with the original material.

Repairing delaminated slate and brownstone grave markers also requires a skilled mason or conservator. With this condition, there are openings along bedding planes which expose the stone grave marker to moisture intrusion. Treatments are design to eliminate or reduce moisture intrusion that would accelerate deterioration. The selection of appropriate repair materials and procedures depends on the severity of the condition. Traditionally, delaminated slate or brownstone grave markers were “capped” with a strip of lead or other metal. Today, this repair technique is seldom used, in part because the drilling procedure used to attach the cap can be damaging, if the stone is brittle. Also, there are toxicity issues associated with the use of lead. An alternative approach is to fill the openings exposed by delamination with grout or patching material that is compatible with the stone. Adhesion of the repair material to the delaminated surfaces is particularly important.

The decision whether to use patching material or undertake a dutchman repair with matching material depends on the grave marker material, location of the damaged area, size, and other factors. A successfully executed dutchman usually results in a repair that has long durability and maintains a similar weathering pattern to the adjacent historic material. When working with stone grave markers, repairs using dutchman techniques are best done by a skilled stone craftsman.

Detached fragments should be collected, documented and stored in a suitable facility. Reattachment of these fragments should be undertaken by a conservator or mason. This work often requires pins to reinforce the joints and patching to compensate for losses.

Protective treatments

Protective treatments for metal, stone, and wood grave markers stabilize corrosion and protect the monument from rainwater, pollutants, and other contaminants. Treatments may vary not only due to material differences, but also to specific site conditions.

Wax coatings are often used for bronze markers (Fig. 22). Wax provides a protective barrier against moisture, soiling, and graffiti. There are several steps in the wax application process. Where there is little corrosion, gentle cleaning of the marker is undertaken prior to applying the wax coating. Apply a thin layer of wax to the marker using a stencil brush or chip brush. Mineral spirits can be added to the wax to facilitate



Figure 22. A protective coating must be maintained on metal elements. Wax or lacquer coatings help preserve the bronze patina and slow corrosion. Conservators apply a microcrystalline wax to this bust at St. Mark's Church in-the-Bowery, New York, NY. Photo: John Scott.

brush application. A soft, clean cloth is used to remove excess wax and buff the surface. A second coat of wax is sometimes needed.

In most climates, iron objects require coatings to protect them from corrosion. Clear coatings are sometimes used to protect wrought iron objects. A corrosion inhibitive primer and topcoat are used for cast iron and steel objects. Direct-to-Metal (DTM) coatings combine the two. Because of their durability, acrylic enamels, urethane, and fluoropolymer coatings are preferred. Proper surface preparation is important, including the removal of surface soiling, flaking paint, and loose rust. This can be accomplished with compressed air, wire brushing, solvent rinsing, or other cleaning method. Next the surface is cleaned with a damp cloth, repeatedly rinsing the cloth as needed. While the surface needs to be thoroughly dried before painting, it is important to repaint as soon as possible since even overnight condensation deposits are not desirable.

Another approach for iron objects is using a rust converter to stabilize corrosion that involves less surface preparation. Commercially available rust converters contain tannin or phosphoric acid and react with rust to form more stable iron compounds. The surface must be painted following surface preparation with the rust converter.

Limewash is a traditional coating that brightens stucco-covered grave markers (Fig. 23). Like paint coatings, it needs to be periodically applied. Limewash is prepared with lime putty or hydrated lime and water. Curing begins following application. The lime putty or hydrated lime reacts with carbon dioxide in the air in a process called carbonation. This reaction eventually forms calcium carbonate, a stable hard coating. Limewash is a “green” coating with no volatile organic compound content and is “breathable,” i.e., it allows for water vapor transmission. Although commonly white, limewash can be colored or tinted with alkali-stable pigments such as iron oxide.



Figure 23. Limewash is a breathable coating sometimes used to protect the surface of the grave marker and provide a decorative finish. Limewash is applied by brush in five to eight thin coats (with each coat about the consistency of skim milk). The surface is allowed to slowly dry between coats. Sometimes the surface is covered by damp burlap to slow the drying process. Photo: Sarah Jackson.

Before applying the limewash, the masonry surfaces should be inspected for coating residues that need to be removed and any required repair work undertaken. Stucco-covered surfaces should be repaired and allowed to fully cure before applying limewash. If the original color has been determined, the renewal coating can be formulated to match. In preparing the wash, enough water is added to lime putty or hydrated lime to produce slurry with the consistency of skim milk. A mixture of four parts water and one part lime usually works well. A Zahn or Ford cup can be found at a hardware store and used to measure the thickness of the limewash and ensure consistency with each batch. Although many traditional recipes include additives, a simple mixture of lime and water performs best. Using a power drill with a paddle attachment to stir the limewash will help ensure that the lime particles are fully suspended in the

mixture. Any pigment for coloration is added during the final mixing.

The surface must be cleaned of old coating residues, soiling, and other contaminants. After dampening the surface, the limewash is applied in 5-8 thin coats, allowing each coat to dry between applications. Limewash is translucent immediately after application and then becomes opaque when dry.

Proper curing of limewash is critical to its durability. To prevent premature drying, the treated surface may need to be covered with damp burlap. Limewash must not be applied when frost or freeze conditions are predicted or in temperatures above 90° F. Ideally, limewash should be applied during spring or fall when temperatures are around 70° F, avoiding direct sunlight where possible.

Clear water repellents and consolidation treatments are sometimes considered for severely deteriorated grave markers, including unpainted wood markers and masonry. For wood markers, epoxy consolidants are used to patch and repair. For masonry materials, it is important to remember that they are porous, and water vapor and liquid water can travel through their internal network. Protective treatments must allow for water vapor transmission to prevent trapping moisture inside the marker. Although a wide variety of water repellents have been employed on masonry (wax, acrylic, epoxy resins, etc.), silane and siloxane treatments have been the most successful. These organosilicon compounds are “breathable,” penetrate below the surface, and form chemical bonds with silicate minerals.

When erosion is severe, consolidation treatments (e.g., ethyl silicate) have been used to replace mineral binders lost to weathering (Fig. 24). Because these treatments are not reversible, laboratory and on-site testing are essential. Application by a conservator or other experienced preservation professional is advised.



Figure 24. A severely deteriorating monument or grave marker can be treated with a stone consolidant. The treatment is usually applied using a spray system. The consolidant soaks into the stone and replaces mineral binders that hold the stone together. On-site and laboratory testing and evaluation are performed prior to using this non-reversible type of treatment. Photo: Lucas Flickinger.

Conclusion

Maintenance is the key to extending the life of historic cemetery grave markers. From ensuring that markers are not damaged by mowing equipment and excessive lawn watering, to proper cleaning and resetting, good cemetery maintenance is the key to extending the life of grave markers. Whether rescuing a long-neglected small cemetery using volunteers or operating a large active cemetery with paid staff, the cemetery's documentation, maintenance and treatment plans should include periodic inspections. Only appropriate repair materials and techniques that do not damage historic markers should be used and records should be kept on specific repair materials used on individual grave markers. A well-maintained cemetery provides an attractive setting that can be appreciated by visitors, serves as a deterrent to vandalism, and provides a respectful place for the dead. A community history recorded in stone, wood and metal markers, cemeteries are an important part of our heritage, and are deserving of preservation efforts (Fig. 25).



Figure 25. Involving the community in activities helps to develop an appreciation for the cemetery and serves to deter vandalism. Events may include children through school or scouting organizations and can help teach across the curriculum. Photo: Debbie Dietrich Smith.

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Whether large or small, well maintained or neglected, historic cemeteries are an important part of our cultural landscape. This historic cemetery at Cape Lookout National Seashore, NC, provides a record of the families who lived in Portsmouth Village during the 19th and early 20th centuries. Photo: Fran Gale.

properties. Additional information offered by Technical Preservation Services is available on our website at www.nps.gov/tps. Further information on the programs and resources of the National Center for Preservation Technology and Training can be found at www.ncptt.nps.gov. Comments about this publication should be made to: Technical Preservation Services, National Park Service, 1849 C Street NW, Washington, DC 20240.

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APPENDIX D: CEMETERY DAMAGE VANDALISM FORM

Cemetery Damage/Vandalism Report Form

Thornbury AME Church Cemetery

1. Human Remains Involved: Y / N
2. Number of Stones/Objects Involved:
3. Location (give Section information and gravemarkers number (s) if available, and a written description of the location, including names on nearby stones and a sketch map):
4. Date/Time Damage First Reported:
5. Name and Contact Information of Individual(s) reporting the damage:
6. When was the area last observed/inspected when no damage was present?
7. Potential witnesses to the event(s) causing the damage (include contact information):
8. Description of the damage (attach photographs or printouts of digital photos):
9. Police Report
 - Date reported to police: Investigating Officer (Name/Badge No.):
 - Police Incident Number (attach a copy of the police report):
 - Follow-Up with Police (dates, notes):

10. Damage estimate (attach justification, conservation treatment proposals and estimates, re-interment costs, if necessary, etc.): \$

11. Repairs conducted (attach conservation treatment reports and photo documentation; indicate if repairs done by the Cemetery Association or the owners of the monuments):

12. If repairs done by the cemetery stewards, complete this part:

Cost of Repairs: \$ Eligible for Insurance Reimbursement? Y / N
Date Claim Submitted: Date Claim Paid:
Amount of Claim Payment: \$ (Attach insurance documentation)

13. Comments:

14. Form completed by:

Date(s):

APPENDIX E: DEATH CERTIFICATES FILLABLE FORM

African American Death Certificates

Thornbury AME Church

Cemetery

Registration District No.

Name Township City Residence

Sex Single, Married, Widowed, or Divorced

If married, widowed, or divorced, Husband of or Wife of

Date of birth

Age: Years Months Days If less than one day hrs or mins.

Occupation of Deceased: Trade, Profession, or particular type of work

General nature of industry, business, or establishment of which employed

Name of Employer

Name of Mother before Marriage

Birthplace (city or town)

Birthplace of Mother (city or town)

(State or country)

Informant

Name of father

Address

Birthplace of father (city or town) NC

Date of Death (month, day and year)

(State or country)

Cause of Death

Place of Burial, Cremation, or removal

Date of Burial

Undertaker

Address

Comments

APPENDIX F: SITE INSPECTION CHECKLIST

SITE INSPECTION CHECKLIST OVERVIEW

Thornbury AME Church Cemetery

Date:

Time of Arrival:

Time of Departure:

Name(s) of Inspector(s):

Current Weather Conditions:

1. Overall Impression:

2. Evidence of new burials? Y / N *

Details:

3. Lawn:

Property trimmed? Y / N

Bare patches? Y / N

Details:

4. Stones (compare current observations with notes from previous inspections; detail observations on Damage Report Forms):

Any new stones present? Y / N *

Any newly toppled, tipped, or sunken stones? Y / N

Any stones with recent damage? Y / N

Any stones requiring cleaning? Y / N

Damage Report Form(s) completed? Y / N / NA

Additional Notes:

5. Plot Boundary Markers:

Any new boundary features present? Y / N *

Any newly toppled, tipped, or sunken? Y / N

Any moved out of place? Y / N

Any new damage (include rusting of metal features)? Y / N

Any requiring cleaning? Y / N

Damage Report Form completed? Y / N / NA

Details:

6. Trees/Shrubs:

Any recently planted trees or shrubs? Y / N *

Dead or Diseased Trees/Shrubs? Y / N

Trees/Shrubs Requiring Pruning? Y / N

Overall condition:

7. Other Plantings:

Invasive plants requiring attention (weeds; poison ivy; etc.) Y / N

New intentional plantings? Y / N *

Overall health of intentional plantings?

Details:

8. Roadways/Pathways:

Any damage? Y / N

Work Required? Y / N **

Details:

9. Signs:

Overall Condition (include lettering, fastening):

Work Required? Y / N **

Details:

10. Vandalism:

Vandalism Present? Y / N

Damage Report Form completed: Y / N

Details (include location, type of vandalism):

11. Litter:

Litter Present? Y / N

Level of Clean-Up Required (i.e., removed during inspection, small group with trash bags, or large group and dumpster necessary):

16. Other Observations:

NOTES:

* All new, intentional landscape features need to be mapped and inventoried.

** If work is required, please indicate if it is urgently required (for example, damage or conditions that are immediate safety concerns for the cemetery property and/or visitors).