PENETROMETER STUDY OF THE MACEDONIA BAPTIST CHURCH, CHEROKEE COUNTY, SOUTH CAROLINA

CHICORA RESEARCH CONTRIBUTION 465

PENETROMETER STUDY OF THE MACEDONIA BAPTIST CHURCH, CHEROKEE COUNTY, SOUTH CAROLINA

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CHICORA RESEARCH CONTRIBUTION 465

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ABSTRACT

This study reports on a penetrometer survey of the Macedonia Baptist Church Cemetery in western Cherokee County, South Carolina. The church was organized in 1820, with the burial grounds beginning shortly thereafter. Today the cemetery encompasses about 1.6 acres.

The study found evidence for 134 unmarked graves, primarily in the older section of the cemetery, closer to the main road. There were areas of very high compaction close to the church and along the northwest edge of the church. These are areas that have been affected by construction and grading. Although no graves could be identified in these areas, it is unlikely that any are present.

It is possible that false negatives resulted in the failure to identify graves. Thus, graves set out in proximity to older graves should be excavated with caution.

This study also contains recommendations to improve the care exercised during mowing, to cease the use of herbicides around stones, to more carefully oversee all grave excavations, to eliminate the discard of spoil at the edge of the cemetery, and to undertake critical conservation treatments of deteriorating stones.

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INTRODUCTION

In July 2006 Mr. James Goforth of the Macedonia Baptist Church in Gaffney, South Carolina contacted the foundation, requesting a proposal to conduct a penetrometer survey of the cemetery. The Church was in the early stages of preservation efforts and they thought that an appropriate place to begin would be to determine if several large open areas in the cemetery contained graves.

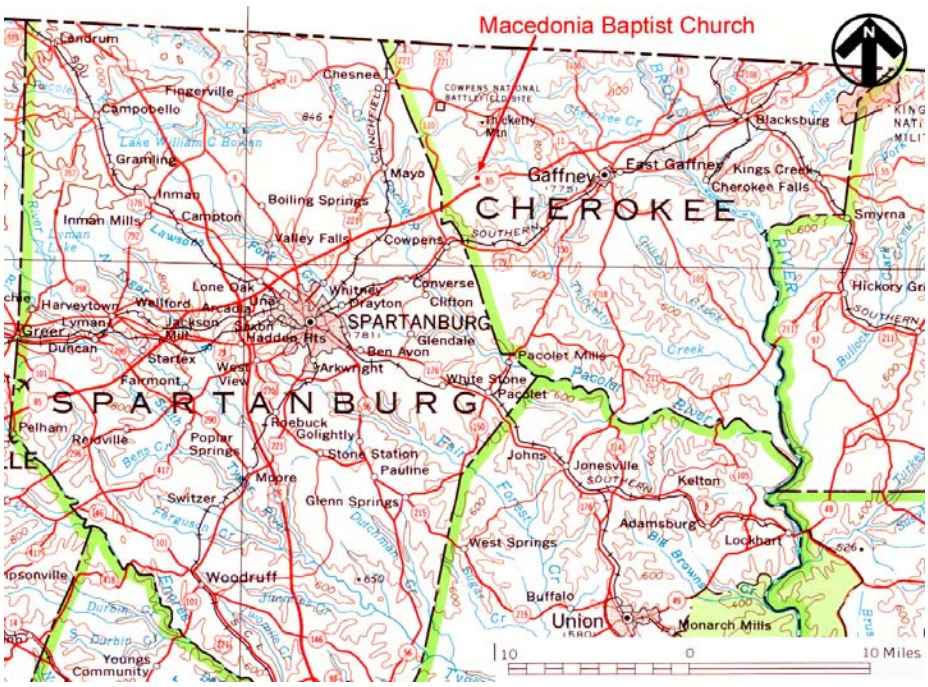

Figure 1. Portion of the State of South Carolina 1:500,000 scale map showing the Macedonia Church and Cemetery location in Cherokee County.

The process and technique of using a penetrometer was explained in emails over several months with a proposal provided in late August 2006. This proposal was approved on October 3, but the actual investigation could not be conducted until January 16, 2007.

At that time the investigation was conducted by the author, assisted by Nicole Southerland and Julie Poppell. A total of 18 person hours were spent involved in the field investigation.

Macedonia Baptist Church is situated on the western edge of Cherokee County, South Carolina, about 13 miles northeast of Spartanburg (Figure 1). The topography in the immediate area, characteristic of the piedmont, is rolling. The area slopes steeply to the north and east, while the ridge is slightly higher in elevation to the southwest. Soils in the area are primarily eroded Cecil sandy loams with 2-6% slopes (Jones 1962:Map 11). These soils frequently have up to 0.5 foot of dark-brown (10YR4/3) sandy loam overlying about 0.6 foot of yellowish-red (5YR5/6) sandy clay loam. This rests on about a foot of stiff red (2.5YR5/6) clay to depths of nearly 6 feet (Jones 1962:15).

The Church is on the east side of Macedonia Road about 0.3 miles north of the I-85 Macedonia exit. The area is predominately rural. The church was organized in 1820, with the first structure built ca. 1822. The current church, however, was built in 1962, although it incorporates an older sanctuary and an addition

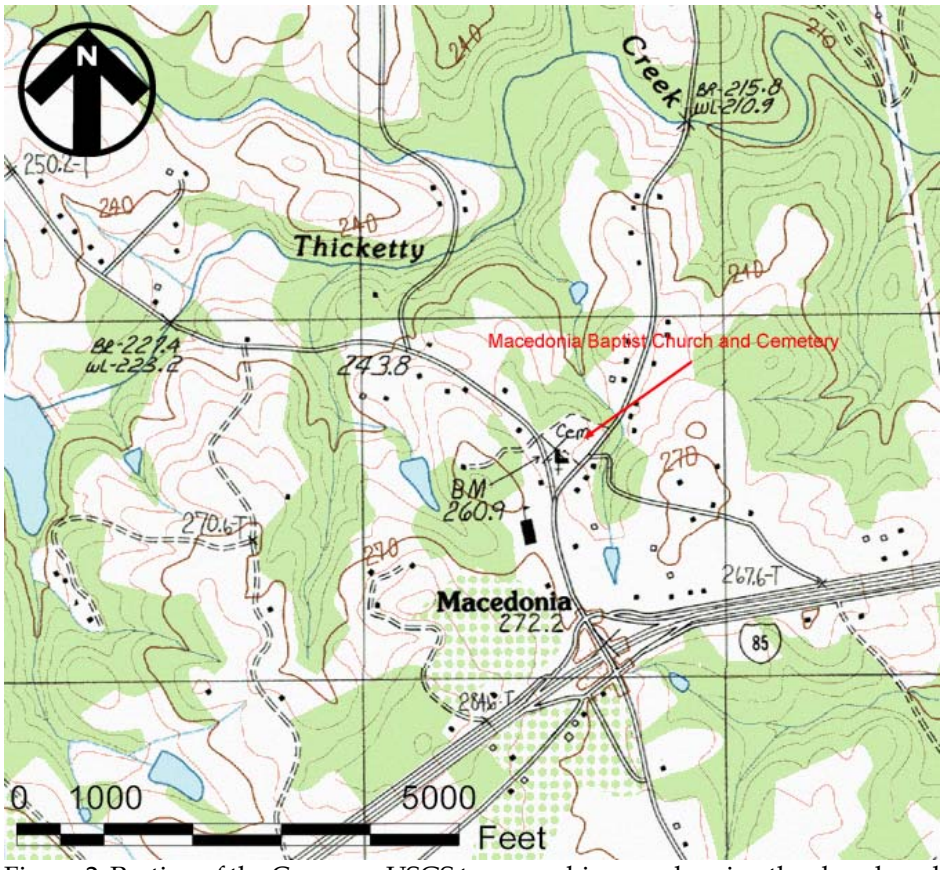

Figure 2. Portion of the Cowpens USGS topographic map showing the church and cemetery.

constructed in 1982 (Anonymous 1995).

The cemetery encompasses an area of about 1.6 acres, with the oldest section toward the front (or southwest). The newest areas are to the rear on more strongly sloping ground. For the most part the layout follows a rather uniform and formal arrangement of plots. There are, however, some areas where plots or partial rows have been placed between previously defined plots, causing an irregular pattern. While informants comment that the cemetery at one time had a number of trees and other plantings, there are none today, creating a rather stark landscape.

METHODS AND FINDINGS

Methods

A penetrometer is a device for measuring the compaction of soil. Soil compaction is well understood in construction, where its primary objective is to achieve a soil density that will carry specified loads without undue settlement and in agronomy where it is recognized as an unfavorable by-product of tillage. Compaction is less well understood in archaeology, although some work has been conducted in exploring the effects of compaction on archaeological materials (see, for example, Ebeid 1992).

Figure 3. View of the church buildings and cemetery, looking south from the parking area.

In the most general sense, the compaction of soil requires movement and rearrangement of individual soil particles. This fits them together and fills the voids that may be present, especially in fill materials. For the necessary movement to occur, friction must be reduced, typically by ensuring that the soil has the proper amount of moisture. If too much is present, some will be expelled and in the extreme, the soils become soupy or like quicksand and compaction is not possible. If too little is present, there will not be adequate lubrication of the soil particles and, again, compaction is impossible. For each soil type and condition, there is an optimum level to allow compaction.

When natural soil strata are disturbed – whether by large scale construction or by the excavation of a small hole in the ground – the resulting spoil contains a large volume of voids and the compaction of the soil is very low. When this spoil is used as fill, either in the original hole or at another location, it likewise has a large volume of voids and a very low compaction.

In construction, such fill is artificially compacted, settling under a load as air and water are expelled. For example, compaction by heavy rubber-tired vehicles will produce a change in density or compaction as deep as 4.0 feet. In agriculture, tillage is normally confined to dry weather or the end of the growing season – when the lubricating effects of water are minimized.

In the case of a pit, or a burial, the excavated fill is typically thrown back in the hole not as thin layers that are then compacted before the next layer is added, but in one, relatively quick episode. This prevents the fill from being compacted, or at least as compacted as the surrounding soil.

Penetrometers come in a variety of styles, but all measure compaction as a numerical reading, typically as pounds per square inch (psi). The dickey-John penetrometer consists of a stainless steel rod about 3-feet in length, connected to a T-handle. As the rod is inserted in the soil, the compaction needle rotates within an oil filled (for damping) stainless steel housing, indicating the compaction levels. The rod is also engraved at 3-inch levels, allowing more precise collection of compaction measurements through various soil horizons. Two tips (½-inch and ¾-inch) are provided for different soil types.

Of course, a penetrometer is simply a measuring device. It cannot distinguish soil compacted by natural events from soil artificially compacted. Nor can it distinguish an artificially excavated pit from a tree throw that has been filled in. Nor can it, per se, distinguish between a hole dug as a hearth and a hole dug as a burial pit. What it does, is convert each of these events to psi readings. It is then up to the operator to determine through various techniques the cause of the increased or lowered soil compaction.

For example, soils that have been artificially compacted frequently exhibit compaction levels that are significantly above normal soil readings. And as for distinguishing a burial pit from other, natural, events, this is typically done by carefully marking out the size, shape, and orientation of the area of lesser compaction.

Curiously, penetrometers are rarely used by archaeologists in routine studies, although they are used by forensic anthropologists (such as Drs. Dennis Dirkmaat and Steve Nawrocki) and by the Federal Bureau of Investigation (Special Agent Michael Hockrein) in searches for clandestine graves. While a penetrometer may be only marginally better than a probe in the hands of an exceedingly skilled individual with years of experience, such ideal circumstances are rare. In addition, a penetrometer provides quantitative readings that are replicable and that allow much more accurate documentation of cemeteries. In fact, as will be discussed here, our research in both sandy and clayey soils in Virginia, North Carolina, South Carolina, and Georgia suggests very consistent graveyard readings.

Like probing, the penetrometer is used at set intervals along grid lines established perpendicular to the suspected grave orientations. The readings are recorded and used to develop a map of probable grave locations. In addition, it is important to "calibrate" the penetrometer to the specific site where it is being used. Since readings are affected by soil moisture and even to some degree by soil texture, it is important to compare readings taken during a single investigation and ensure that soils are generally similar in composition.

It is also important to compare suspect readings to those from known areas. For example, when searching for graves in a cemetery where both marked and unmarked graves are present, it is usually appropriate to begin by examining known graves to identify the range of compaction present. From work at several graveyards, including the Kings Cemetery (Charleston County, South Carolina) where 28 additional graves were identified, Maple Grove Cemetery (Haywood County, North Carolina) where 319 unmarked graves were identified, and the Walker Family Cemetery (Greenville County, South Carolina) where 78 unmarked graves were identified, we have found that the compaction of graves is typically under 150 psi, usually in the range of 50 to 100 psi, while non-grave areas exhibit compaction that is almost always over 150 PSI, typically 160 to 180 psi (Trinkley and Hacker 1997a, 1997b, 1998; Trinkley and Southerland 2007).

For example, at Kings Cemetery it was possible to produce several compaction cross

Figure 4. Conducting the penetrometer survey. In the background are three unmarked graves identified by the study that have been flagged.

sections through cultivated fields, old (fallow) fields, woods, roads, bulldozed areas, and cemetery areas (Trinkley and Hacker 1997a:Figure 10). Particularly important were the location of graves made obvious by either monuments or sunken grave shafts.

Cultivated areas and burials both revealed compaction readings under 100 psi. Of course the two areas could be distinguished from each other by the depth of the various compaction readings. The cultivated fields were underlain by soils with compaction readings between 200 and 300 psi, usually within 0.8 foot of the surface. Burials, on the other hand, revealed the lower compaction readings to depth of 3.0 feet.

The roads and other disturbed areas, such as where bulldozers had recently been operated, exhibited compaction levels of over 300 psi. In such areas it is usually impossible to distinguish burials – they are effectively "masked" by the increased soil density.

Between burials, in areas where there was no evidence of burials, compaction ranged from 101 to 300 psi. This suggests that in some areas there may have been earlier graves, at least partially masked by more recent, intrusive graves.

After the examination of over 30 cemeteries using a penetrometer, we are relatively confident that the same ranges will be found throughout the Carolinas and Georgia. It is likely these ranges are far more dependent on general soil characteristics (such as texture and moisture) than on cultural aspects of the burial process.

The process works best when there are clear and distinct non-grave areas, i.e., when the graves are not overlapping. In such cases taking penetrometer readings at 2-foot intervals perpendicular to the supposed orientation (assuming east-west orientations, the survey lines would be established north-south) will typically allow the quick identification of something approaching the mid-point of the grave. Working along the survey line forward and backward (i.e. north and south) will allow the north and south edges of the grave to be identified. From there, the grave is tested perpendicular to the survey line, along the grave's center-line, in order to identify the head and foot.

Typically the head and foot are both marked using surveyor's pen flags. We have also found that it is helpful to run a ribbon of flagging from the head flag to the foot flag, since the heads and feet in tightly packed cemeteries begin to blur together.

Implemented Methods and Findings

Initially we "calibrated" the penetrometer by examining the marked graves, primarily in the older section of the cemetery, close to Macedonia Road. We found that the soil compaction varied from about 50 psi to no greater than 75 psi.

Figure 5. Area on the northwest edge of the cemetery showing grading and an absence of graves.

Outside the known grave areas, the psi increased significantly from 150 psi to over 200 psi.

The only exception is that we found a number of graves, dating primarily in the 1960s and early 1970s, with compaction ranges of 300 psi and above – readings significantly above even areas where no graves were present. We believe that for a period of time the grave excavation firm was using a "tamper" to compact the soil. This is often done to facilitate the relaying of sod and minimize the need to return to the cemetery to repair sunken graves. It is, of course, only done when a vault is present (compaction of this nature would otherwise have the potential to damage the coffin).

We found that no graves were identified along the outer northwest or southeast edges of the cemetery. To the northwest, along the edge of the parking lot, the topography has a swale and slope that is characteristic of grading. The compaction levels (200 psi and higher) in this area are consistent with clay subsoils, perhaps with additional compaction through the use of heavy equipment. Not only were we not able to identify any areas of lower compaction that might represent graves, but the removal of 1-2 feet of soil would almost certainly have revealed coffin outlines. Thus it is highly unlikely that graves are found in these areas.

The number of unmarked graves in the rear quarter of the cemetery – which is also the most recent section – is also very low. It is also unlikely that any graves would be missed in this area since most of those we checked evidenced the use of vaults.

Figure 6. Although the stone has no death date engraved, the penetrometer study confirmed a burial.

In the remainder of the cemetery, however, we observed a rather large number of

Figure 7. View of cemetery showing graves (marked with flags and flagging tape) identified by the penetrometer study.

probable graves. A total of 134 probable graves were marked during this assessment. Most occur as one, two, or three graves mixed among marked graves. Some appear to represent children, based on their size, and many children's graves went unmarked historically.

We observed stones without death dates, but where the plot was shown to be occupied by the penetrometer. While relatives no doubt are aware that the plot has been filled, there is no obvious, public record without the stone being updated.

Other Preservation Issues

During this study several other preservation issues were observed that we were asked to comment on. These are briefly discussed below.

Lawn Maintenance

We observed a number of stones that evidenced damage as a result of mowing. The Church should ensure that a more sensitive and careful approach is taken.

There is also abundant evidence that the lawn service has used a broad spectrum herbicide to kill the grass around stones and plots. This is a very bad practice and should cease immediately. It is disfiguring to the landscape, causing erosion around the stone, with much splash-back and staining of the stones. With the grass killed, it promotes a heavy weed infestation that will spread into the turfgrass. In addition herbicides contain salts that will, over time, cause serious damage to the stones. In the place of this poor management practice the lawn service should use nylon trimmers (with trimmer no greater than 0.065 inch in diameter).

Burial Practices

We observed numerous footstones, curbing, stone bases, and statuary discarded in the woods around the edge of the cemetery. This suggests that items were moved to allow backhoe access for the excavation of graves and then were discarded by the grave excavation service, rather than being replaced.

This is exceptionally disrespectful to those buried in the cemetery and their families. It demonstrates the lowest possible standards and a complete absence of professional behavior.

An effort should be made to replace those elements that have been discarded.

In addition, no graves should be opened without a church representative present to approve, in writing, all work conducted. A representative should also be present during the closing of graves. Firms that have two or more problems should be prohibited from engaging in

Figure 8. Lawn maintenance problems. The top photo shows mower damage to a flush monument. The lower photo shows the results of herbicide use: increased weeds, disfigured landscape, and much splash back of clay from erosion.

Figure 9. Markers discarded in the woods around the edge of the cemetery. This practice must cease immediately and these stones replaced in the cemetery.

Figure 10. Spoil piles at the edge of the cemetery. In one we identified the remains of a funeral home plate that had been removed with the spoil – effectively losing this burial information.

Figure 11. The top photo shows one plot built over another. The lower shows cremains placed in the cemetery without the knowledge of the church.

future burials or should be required to post a $1000 bond to cover damages.

We also observed large mounds of spoil, resulting from the use of vaults. This spoil should not be placed at the edge of the cemetery. It disfigures the landscape and detracts from the beauty of the cemetery. Burial firms should be directed to remove all spoil (or the church may direct its disposal in other areas). Again, any firm violating this requirement should be prohibited from doing future work or a bond should be required.

General Management Practices

We understand that (at times) burials are made without any prior arrangement with the church. This is not only obvious by the poor workmanship of the burial excavation firms, but also by the discovery of a stone with no associated grave and an excavation for cremains about which the church was unaware.

There are also many stones with no death date indicated – calling into question whether the plot has been used.

It is also clear that plots have been laid out with no particular regard for pattern or organization. In fact, at least one plot overlaps a prior plot. Some plots are placed so as to prevent other full-sized plots being established in that area.

The church should require that all burials receive prior approval and that all future plots are laid out in a pre-established format, size, and location. No burial should be allowed without the approval of the church.

Figure 12. Example of unacceptably repaired stone. The stone is poorly matched on the sides and there is much epoxy left dribbling down the face of the marker.

Damage and Treatment

Although most monuments are in good condition, we identified a small number that require immediate attention. Treatment proposals for these stones are included in this study as appendix 1.

Repairs should be conducted by trained stone conservations who subscribe to the code of ethics and standards of practice of the American Institute for Conservation (AIC).

We observed several stones that had been repaired in the past. In general these repairs are poorly executed, resulting in additional damage to the stone. The church should assist families in locating appropriate repair assistance. In general, monument companies, while familiar with modern stone are neither trained in, nor do they have the expertise, to repair historic stone.

SUMMARY

Penetrometer Study

The penetrometer study conducted at the Macedonia Baptist Church identified 134 unmarked graves, primarily in the southwestern half of the cemetery. Unmarked graves declined in frequency toward the rear – or more modern section of the cemetery.

We found no indication of graves either in the open area next to the church or along the northwestern edge. In both areas we found high levels of ground compaction, suggestive of undisturbed soils.

Care should, however, be exercised in placing burials in any cemetery where there has not been accurate recordation of interments. A penetrometer can provide false negatives, showing compact soil in a burial as a result of artificial compaction – either intentional (for example, as the result of using a "tamper") or unintentional (for example, as the result of heavy equipment compaction). The only certain means of determining the exact position of graves is through careful archaeological stripping of overlying soil – a technique that is both expensive and intrusive in an operating cemetery. Consequently, if during grave excavation discolored soil is identified, the excavation should cease and the spot more carefully inspected.

Recommendations Regarding Other Preservation Issues

At the request of the Church we examined several other preservation issues in the cemetery and can offer recommendations regarding changes in maintenance and on-going operation.

1. It is important that landscape maintenance practices be upgraded. There is extensive damage to markers from scalping during mowing, as well as impact by mowers. All mowers in the cemetery should have closed cell foam bumpers installed. Workers should be cautioned to slow down and take greater care. And the Church should have a representative approve all actions in the cemetery.

2. The use of herbicide to create "kill zones" around monuments must cease immediately. This is professionally unacceptable and is causing extensive damage to the landscape and the cemetery.

3. All burials and burial locations in the cemetery must be authorized in advance by the church. The laissez faire approach exercised thus far has caused plots to overlap and for plots to be placed between pre-existing rows.

4. There is evidence that the firms retained to excavate burial pits have been discarding markers that have been in their way. This is an unacceptable practice that must cease immediately. We recommend that the Church oversee all future excavations and require immediate repair of any damage. If backhoes are unable to operate in a safe and respectful manner in the cemetery, then the Church should require hand excavation of all graves – a practice that is actually quite common in historic cemeteries.

5. There are a small number of damaged or deteriorating monuments. These should receive immediate treatment to prevent their loss and ensure the safety of

cemetery visitors.

6. All existing plots should be mapped by the Church, allowing new plots to be laid out in an orderly fashion.

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APPENDIX 1. TREATMENT PROPOSALS

Twelve monuments have been identified for treatment. These involve several that are badly tilting and susceptible to additional damage, several that are broken and requiring repair to restore their beauty and functionality, and several that are loose and susceptible to theft or additional damage. These stones – and their repair costs – are itemized below. These treatment costs do not include travel, per diem, or lodging since these costs depend on whether only selected stone or all are approved for treatment.

Estimated Treatment Costs

Stone	Cost	Stone	Cost
1	$85.00	7	$495.00
2	735.00	8	495.00
3	130.00	9	165.00
4	65.00	10	790.00
5	125.00	11	320.00
6	140.00	12	920.00

The total cost is $4,465. If all of the work were to be approved, it would require approximately one week. The travel, per diem, and lodging costs would be approximately $2,350 (500 miles @ .50¢/mile, $250; 15 days per diem @ $35/day, $525; 15 nights lodging @ $105/night, $1,575). Thus, the total cost would be $6,815.00.

CONSERVATION TREATMENT PROPOSAL
CEMETERY MARKERS

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

Location: Macedonia Baptist Church, Cherokee Co. **State:** SC **Site No.:**

Marker #: 1 **Name:** **Dimensions:**

Photographs: Before Treatment

Brief Condition Report

Marble tab in socket. Stone is well set in socket, but die is poorly set, resulting in the stone being out of plumb by about 15º. This puts additional stress on the stone and contributes to the stone breaking. The monument also exhibits heavy atmospheric staining, likely gypsum crust. Moderate biologicals.

Pre-Treatment Photograph

Treatment Proposal

Stone will be reset in a pea gravel footing. This will promote drainage away from the stone and will also allow some movement should the stone be impacted by lawn maintenance or other activities. Once reset the stone will be cleaned with D/2 Architectural Antimicrobial and flushed with potable water.

Proposed Time, Materials, and Costs

Estimated Time

	Hours	Rate	Subtotal
Conservator	0.5	$60	$30.00
Assistant Conservator	1	$40	$40.00

Estimated Materials

	Cost	Subtotal
D/2	$10	$10.00
pea gravel	$5	$5.00
		$0.00
		$0.00
		$0.00
		$0.00
		$0.00
Estimated Total		$85.00

Other Notes or Observations:
Treatment cost does not include travel, per diem, or lodging

Reported By: M. Trinkley **Date:** February 2, 2007

CONSERVATION TREATMENT PROPOSAL
CEMETERY MARKERS

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

Location: Macedonia Baptist Church, Cherokee Co. **State:** SC **Site No.:**

Marker #: 2 **Name:** **Dimensions:**

Photographs: Before Treatment

Brief Condition Report

Marble die on base with two ferrous pins, both broken and exhibiting extensive iron jacking. The die is no longer stable on the base. The base is no longer set level. Moderate atmospheric staining and moderate biologicals. Some iron staining from the ferrous pins and the clay. These iron pins must be removed or they will continue to corrode and will eventually spall the stone.

Pre-Treatment Photograph

Treatment Proposal

A diamond core drill will be used to remove the four ferrous pin stubs. The base will be leveled in pea gravel to promote drainage and to allow some movement should the stone be impacted by lawn maintenance or other activities. The ferrous pins will be replaced with threaded 316 stainless steel pins. These pins will be adhered in the lower holes only using a hi-mod, moisture insensitive structural epoxy. A 1:3 mix of NHL 3.5 and sand will be used to reset the stone. After curing the stone will be washed using D/2 Architectural Antimicrobial and flushed with potable water.

Proposed Time, Materials, and Costs

Estimated Time

	Hours	Rate	Subtotal
Conservator	4	$60	$240.00
Assistant Conservator	10	$40	$400.00

Estimated Materials

	Cost	Subtotal
D/2	$10	$10.00
pea gravel	$5	$5.00
316 stainless pins	$10	$10.00
epoxy	$10	$10.00
1:3 mix	$10	$10.00
expendibles	$50	$50.00
		$0.00
Estimated Total		$735.00

Other Notes or Observations:
Treatment cost does not include travel, per diem, or lodging

Reported By: M. Trinkley **Date:** February 2, 2007

CONSERVATION TREATMENT PROPOSAL
CEMETERY MARKERS

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

Location: Macedonia Baptist Church, Cherokee Co. **State:** SC **Site No.:**

Marker #: 3 **Name:** **Dimensions:**

Photographs: Before Treatment

Brief Condition Report

Steatite headstone and footstone. The footstone has been improperly set (likely to allow easier mowing) and requires appropriate placement. Both are heavily stained by clay. The headstone exhibits black staining of unknown origin which requires testing for removal. This represents one of the earlier stones (1847) and is particularly valuable.

Pre-Treatment Photograph

Treatment Proposal

The footstone will be excavated and replaced ca. 5-feet from the headstone, set in a pea gravel footing. This will promote drainage away from the stone and will also allow some movement should the stone be impacted by lawn maintenance or other activities. Several cleaners will be tested on the black material found on the headstone to determine the best cleaning approach. The selected product will be used to remove the stains.

Proposed Time, Materials, and Costs

Estimated Time

	Hours	Rate	Subtotal
Conservator	1	$60	$60.00
Assistant Conservator	1	$40	$40.00

Estimated Materials

	Cost	Subtotal
pea gravel	$5	$5.00
cleaning tests	$25	$25.00
		$0.00
		$0.00
		$0.00
		$0.00
		$0.00

Estimated Total $130.00

Other Notes or Observations:
Treatment cost does not include travel, per diem, or lodging

Reported By: M. Trinkley **Date:** February 2, 2007

CONSERVATION TREATMENT PROPOSAL
CEMETERY MARKERS

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

Location: Macedonia Baptist Church, Cherokee Co. **State:** SC **Site No.:**

Marker #: 4 **Name:** **Dimensions:**

Photographs: Before Treatment

Brief Condition Report

Marble footstone out of the ground and lying on the surface, subject to damage or theft. Stone requires resetting. Afterwards the stone will be cleaned using D/2 Architectural Antimicrobial and flushed with potable water.

Pre-Treatment Photograph

Treatment Proposal

The footstone will be paired with its headstone and reset ca. 5 feet below the headstone in a pea gravel footing. This will promote drainage away from the stone and will provide some movement should the stone be impacted by lawn maintenance or other activities. Afterwards the stone will be cleaned with D/2 Architectural Antimicrobial and flushed with potable water.

Proposed Time, Materials, and Costs

Estimated Time

	Hours	Rate	Subtotal
Conservator	0.5	$60	$30.00
Assistant Conservator	0.5	$40	$20.00

Estimated Materials

	Cost	Subtotal
D/2	$10	$10.00
pea gravel	$5	$5.00
		$0.00
		$0.00
		$0.00
		$0.00
		$0.00
Estimated Total		$65.00

Other Notes or Observations:
Treatment cost does not include travel, per diem, or lodging

Reported By: M. Trinkley **Date:** February 2, 2007

CONSERVATION TREATMENT PROPOSAL
CEMETERY MARKERS

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

Location: Macedonia Baptist Church, Cherokee Co. **State:** SC **Site No.:**

Marker #: 5 **Name:** **Dimensions:**

Photographs: Before Treatment

Brief Condition Report

Granite die on base. The die is no longer attached to the base and is unstable. Much old setting compound on the die and base. Moderate biologicals overall.

Pre-Treatment Photograph

Treatment Proposal

Granite die will be removed, allowing the base of the die and the top of the base to be cleaned of adhering setting compound. The die will be reset using proprietary setting compound designed for granite markers. The stone will be cleaned using D/2 Architectural Antimicrobial and flushed with potable water.

Proposed Time, Materials, and Costs

Estimated Time

	Hours	Rate	Subtotal
Conservator	1	$60	$60.00
Assistant Conservator	1	$40	$40.00

Estimated Materials

	Cost	Subtotal
D/2	$10	$10.00
setting compound	$15	$15.00
		$0.00
		$0.00
		$0.00
		$0.00
		$0.00
Estimated Total		$125.00

Other Notes or Observations:
Treatment cost does not include travel, per diem, or lodging

Reported By: M. Trinkley **Date:** February 2, 2007

CONSERVATION TREATMENT PROPOSAL
CEMETERY MARKERS

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

Location: Macedonia Baptist Church, Cherokee Co. **State:** SC **Site No.:**

Marker #: 6 **Name:** **Dimensions:**

Photographs: Before Treatment

Brief Condition Report

Marble pedestal tomb with missing finial. There is a ferrous pin still in place which require removal. Otherwise biologicals and atmospheric staining are light. Monument appears stable.

Pre-Treatment Photograph

Treatment Proposal

The ferrous pin will be core drilled out and the hole will be infilled with Jahn M120 Marble Mortar. After setting the stone will be cleaned using D/2 Architectural Antimicrobial and flushed with potable water.

Proposed Time, Materials, and Costs

Estimated Time

	Hours	Rate	Subtotal
Conservator	1	$60	$60.00
Assistant Conservator	1.5	$40	$60.00

Estimated Materials

	Cost	Subtotal
Jahn M120	$10	$10.00
D/2	$10	$10.00
		$0.00
		$0.00
		$0.00
		$0.00
		$0.00

Estimated Total $140.00

Other Notes or Observations:
Treatment cost does not include travel, per diem, or lodging

Reported By: M. Trinkley **Date:** February 2, 2007

CONSERVATION TREATMENT PROPOSAL
CEMETERY MARKERS

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

Location: Macedonia Baptist Church, Cherokee Co. **State:** SC **Site No.:**

Marker #: 7 **Name:** **Dimensions:**

Photographs: Before Treatment

Brief Condition Report

Marble die on base. Die has fallen, middle base is loose. There are no pins. Base requires leveling. Heavy biologicals overall.

Pre-Treatment Photograph

Treatment Proposal

Base will be reset in pea gravel to promote drainage away from the stone and to allow some movement should the stone be impacted by lawn maintenance or other activities. The base, middle base, and die will be drilled for insertion of two 5/8-inch threaded 316 stainless steel pins to connect them. These pins will be set using a hi-mod, moisture insensitive, structural epoxy. Each base will be set using a 1:3 mix of NHL 3.5 and sand. Once set the stone will be cleaned using D/2 Architectural Antimicrobial and flushed with potable water.

Proposed Time, Materials, and Costs

Estimated Time

	Hours	Rate	Subtotal
Conservator	3	$60	$180.00
Assistant Conservator	6	$40	$240.00

Estimated Materials

	Cost	Subtotal
316 stainless steel pins	$40	$40.00
pea gravel	$5	$5.00
D/2	$10	$10.00
epoxy	$10	$10.00
1:3 mix	$10	$10.00
		$0.00
		$0.00
Estimated Total		$495.00

Other Notes or Observations:
Treatment cost does not include travel, per diem, or lodging

Reported By: M. Trinkley **Date:** February 2, 2007

CONSERVATION TREATMENT PROPOSAL
CEMETERY MARKERS

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

Location: Macedonia Baptist Church, Cherokee Co. **State:** SC **Site No.:**

Marker #: 8 **Name:** **Dimensions:**

Photographs: Before Treatment

Brief Condition Report

Marble die on base. Die and middle base are loose. There are no pins. Base requires leveling. Moderate biologicals overall.

Pre-Treatment Photograph

Treatment Proposal

Base will be reset in pea gravel to promote drainage away from the stone and to allow some movement should the stone be impacted by lawn maintenance or other activities. The base, middle base, and die will be drilled for insertion of two 5/8-inch threaded 316 stainless steel pins to connect them. These pins will be set using a hi-mod, moisture insensitive, structural epoxy. Each base will be set using a 1:3 mix of NHL 3.5 and sand. Once set the stone will be cleaned using D/2 Architectural Antimicrobial and flushed with potable water.

Proposed Time, Materials, and Costs

Estimated Time

	Hours	Rate	Subtotal
Conservator	3	$60	$180.00
Assistant Conservator	6	$40	$240.00

Estimated Materials

	Cost	Subtotal
316 stainless steel pins	$40	$40.00
pea gravel	$5	$5.00
D/2	$10	$10.00
epoxy	$10	$10.00
1:3 mix	$10	$10.00
		$0.00
		$0.00
Estimated Total		$495.00

Other Notes or Observations:
Treatment cost does not include travel, per diem, or lodging

Reported By: M. Trinkley **Date:** February 2, 2007

CONSERVATION TREATMENT PROPOSAL
CEMETERY MARKERS

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

Location: Macedonia Baptist Church, Cherokee Co. **State:** SC **Site No.:**

Marker #: 9 **Name:** **Dimensions:**

Photographs: Before Treatment

Brief Condition Report

Marble tab in socket. There is an old break mid-way up the die; this appears to have received a simple epoxy repair which, at present, is stable. The die, however, is loose in the socket, allowing the stone to lean and this is putting additional stress on the old repair. Treatment has a high priority to prevent additional damage to this stone. The footstone has also been removed and is lying at the base of the headstone. Moderate biologicals and atmospheric staining overall.

Pre-Treatment Photograph

Treatment Proposal

The die will be removed from the base, allowing the base to be reset if necessary. Both the footstone and base of the headstone, if necessary, will be reset in pea gravel to promote drainage away from the stone and allow some movement should the stone be impacted by lawn maintenance or other activities.

The socket will be cleaned, if necessary, and the die will be reset in the socket using a 1:3 mix of NHL 3.5 and marble dust. The stone will be braced until set. After this treatment the stones will be cleaned using D/2 Architectural Antimicrobial and flushed with potable water.

Should the old repair fail during resetting additional treatment, consisting of mechanical removal of the old epoxy, and drilling the stone for the insertion of two threaded 316 stainless steel pins ½-inch in diameter and about 18 inches in length. These will be set using a hi-mod, moisture insensitive structural epoxy. Registration will be checked and the two fragments will be clamped to allow the epoxy to cure for 24-48 hours. The cost of this work is not included in the estimate below, but will add approximately $375 to the total cost.

Proposed Time, Materials, and Costs

Estimated Time

	Hours	Rate	Subtotal
Conservator	1	$60	$60.00
Assistant Conservator	2	$40	$80.00

Estimated Materials

	Cost	Subtotal
pea gravel	$5	$5.00
D/2	$10	$10.00
1:3 mix	$10	$10.00
		$0.00
		$0.00
		$0.00
		$0.00
Estimated Total		$165.00

Other Notes or Observations:
Treatment cost does not include travel, per diem, or lodging

Reported By: M. Trinkley **Date:** February 2, 2007

CONSERVATION TREATMENT PROPOSAL
CEMETERY MARKERS

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

Location: Macedonia Baptist Church, Cherokee Co. **State:** SC **Site No.:**

Marker #: 10 **Name:** **Dimensions:**

Photographs: Before Treatment

Brief Condition Report

Marble arched pedestal tomb. All components are loose. Ferrous pins are present in at least the columns. Monument is severely leaning. Moderate atmospheric staining and biologicals, notably at the top.

Pre-Treatment Photograph

Treatment Proposal

Monument will need to be disassembled to the base, which requires resetting in pea gravel to level. This will promote drainage away from the stone and will allow some movement should the base be impacted by lawn maintenance or other activities.

Ferrous pins will be core drilled out and will be replaced with 316 stainless steel threaded pins of a suitable diameter. The base and sub-base will also be drilled for the insertion of two threaded 316 stainless steel pins. All pins will be set in a hi-mod, moisture insensitive structural epoxy. Stone will also be set using a 1:3 mix of NHL 3.5 and stone dust during reassembly.

After setting the monument will be cleaned using D/2 Architectural Antimicrobial and flushed with potable water.

Proposed Time, Materials, and Costs

Estimated Time

	Hours	Rate	Subtotal
Conservator	4	$60	$240.00
Assistant Conservator	10	$40	$400.00

Estimated Materials

	Cost	Subtotal
316 stainless steel pins	$60	$60.00
epoxy	$15	$15.00
D/2	$10	$10.00
pea gravel	$5	$5.00
1:3 mix	$10	$10.00
Expendibles	$50	$50.00
		$0.00
Estimated Total		$790.00

Other Notes or Observations:
Treatment cost does not include travel, per diem, or lodging

Reported By: M. Trinkley **Date:** February 2, 2007

CONSERVATION TREATMENT PROPOSAL
CEMETERY MARKERS

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

Location: Macedonia Baptist Church, Cherokee Co. **State:** SC **Site No.:**

Marker #: 11 **Name:** **Dimensions:**

Photographs: Before Treatment

Brief Condition Report

Marble footstone broken into three fragments (one is likely still below grade). No biologicals.

Pre-Treatment Photograph

Treatment Proposal

The lower portion of the footstone will be identified through probing and removed for repair.

The footstone will be drilled for insertion of a ½-inch threaded 316 stainless steel pin at both breaks. These will be set using a hi-mod, moisture insensitive structural epoxy. Registration will be checked and the stone will be clamped to allow a 24-48 set. Areas of stone loss will be infilled using Jahn M120 Marble Mortar. No color matching will be conducted, but once cleaned this repair material should blend with the stone.

After curing the stone will be reset in a pea gravel footing to promote drainage away from the stone and to provide for some movement should the stone be impacted by maintenance activities.

The stone will be cleaned using D/2 Architectural Antimicrobial and flushed with potable water.

Proposed Time, Materials, and Costs

Estimated Time

	Hours	Rate	Subtotal
Conservator	2	$60	$120.00
Assistant Conservator	4	$40	$160.00

Estimated Materials

	Cost	Subtotal
Jahn M120	$10	$10.00
316 stainless steel	$20	$20.00
D/2	$5	$5.00
epoxy	$5	$5.00
		$0.00
		$0.00
		$0.00
Estimated Total		$320.00

Other Notes or Observations:
Treatment cost does not include travel, per diem, or lodging

Reported By: M. Trinkley **Date:** February 2, 2007

CONSERVATION TREATMENT PROPOSAL
CEMETERY MARKERS

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

Location: Macedonia Baptist Church, Cherokee Co. **State:** SC **Site No.:**

Marker #: 12 **Name:** **Dimensions:**

Photographs: Before Treatment

Brief Condition Report

Marble tab in socket with two breaks – one at socket and another mid-way up the stone. Both evidence old, failed repairs and the parts are currently set in the plot. Moderate biologicals, heavy atmospheric staining.

Pre-Treatment Photograph

Treatment Proposal

All old repair material will require mechanical removal.

The tab is well set, so it will be necessary to drill all breaks for insertion of threaded 316 stainless steel rods – two at the ground break and two at the break mid-way up. Pins will be ca. ½-inch in diameter and 10-17 inches in length in order to provide appropriate support.

All pins will be set using a hi-mod, moisture insensitive structural epoxy. Registration will be checked and the stone will be clamped to allow a complete set over 24-48 hours.

Areas of loss will be infilled using Jahn M120 Marble Mortar. No color matching will be conducted, but once cleaned the infill should blend in with the stone.

After resetting the stone will be cleaned using D/2 Architectural Antimicrobial and flushed with potable water.

Proposed Time, Materials, and Costs

Estimated Time

	Hours	Rate	Subtotal
Conservator	6	$60	$360.00
Assistant Conservator	12	$40	$480.00

Estimated Materials

	Cost	Subtotal
Jahn M120	$10	$10.00
316 stainless steel pins	$40	$40.00
epoxy	$20	$20.00
D/2	$10	$10.00
		$0.00
		$0.00
		$0.00
Estimated Total		$920.00

Other Notes or Observations:
Treatment cost does not include travel, per diem, or lodging

Reported By: M. Trinkley **Date:** February 2, 2007

Cemetery Preservation Plans

Historical Research

Identification of Grave Locations and Mapping

Condition Assessments

Treatment of Stone and Ironwork

Chicora Foundation, Inc.
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