Rick Schroder 11

From: Jenny McWilliams <Jenny.McWilliams@thc.texas.gov>
Sent: Wednesday, March 22, 2023 12:17 PM
To: Rick Schroder
Subject: RE: James Polk Johnson Cemetery
Attachments: 1. Locating Unmarked Graves.pdf; 2. Cemetery Contractors List 2023.docx; Developing a Preservation Plan.pdf

Rick,

Thanks so much for reaching out about the preservation of the James Polk Johnson Cemetery. We talked about a possible path forward:

- HTC designation (research to help learn more about the history of the cemetery)
- Reaching out to contractors to get estimates for remote sensing to identify unmarked graves and vacant plots; mapping, inventory and assessment of headstones
- Legal land survey (if needed)
- Arborists to assess trees and protect headstones from falling limbs prior to headstone repair
- Possible future replacement of chain link fence.

Please see Locating Unmarked Graves, which is an overview of techniques, and also the cemetery contractors list which provides contact information for specialists. Finally, I've attached a handout on developing a Preservation Plan and standards for preservation. Please let me know if you have any questions about the attachment or links. I look forward to talking to you more about priorities and steps forward.

Please see the following links and be aware of Codes that apply to municipal cemeteries:

- Funding opportunities: https://www.thc.texas.gov/preserve/projects-and-programs/cemetery-preservation/historic-texas-cemetery-designation/funding

- Municipal Regulation of Cemeteries in the Texas Health and Safety Code: https://statutes.capitol.texas.gov/Docs/HS/htm/HS.713.htm

- Teas Antiquities Code: https://www.thc.texas.gov/project-review/antiquities-code-texas#:~:text=The%20Code%20requires%20state%20agencies,affecting%20state%2Downed%20historic%20buildings.

HTC Designation:

Please visit www.thc.texas.gov/htc. You'll get a little more info about the HTC designation. You'll also find the application form, the guidelines and instructions, plus a sample application. Our best recommendation is to follow this process:

1. Read through the Guidelines and Instructions document first. This will give you a good idea of the level and type of research that will be needed for a successful application. It is available to download as a PDF or as a Word document. Keep it handy for when you start to fill out the application.

2. Watch the pre-recorded webinar. Carlyn produced this training session to walk applicants through the designation process step-by-step. It's about 45 minutes long and will give you a good overview of how to fill out the form but will also give you an idea of what to expect during the designation process. You can find the webinar here. It is free and it can help you avoid common mistakes.

3. Once you've done those things, you'll be ready to start putting your application packet together. The application form is available as a Word document or a PDF; use whichever version you are most comfortable with. Again, find it here: www.thc.texas.gov/htc.

There are no deadlines for these applications. We accept them all year-round. It typically takes about 4 months to complete the designation once we receive your application packet. The application fee is just $25. If you have additional questions after reading through this information, please email htc@thc.texas.gov.

Jenny McWilliams

TEXAS HISTORICAL COMMISSION
REAL PLACES TELLING REAL STORIES

DEVELOPING A PRESERVATION PLAN FOR A HISTORIC CEMETERY

Before a blade of grass is cut, before a stone is leveled, before any work is done, it is essential to develop a plan for the preservation of a historic cemetery. A preservation plan is a tool to help establish goals, prioritize activities, estimate costs and develop an annual maintenance schedule. It also contains important records such as survey forms and photographs of each gravestone and feature, and a written history, along with other historical data about the cemetery. Adequate planning takes work, but is worth the effort because it will result in a permanent document that will direct future preservation of the cemetery.

The recommended steps for developing a preservation plan are:

RESEARCH

By researching a cemetery, you learn about its history and character. The use of reliable sources and careful citations is essential to preparing the history of the cemetery. Consult primary sources, such as public records, newspaper accounts, meeting minutes, historical maps and historical photographs. If properly documented, oral histories collected from authoritative sources are also valuable research tools. Professionals, such as archeologists, stonemasons and landscape architects, can contribute invaluable information about the cemetery.

RECORD

To adequately document a cemetery, inventory gravestones and all landscape features.

1. Create a map of the cemetery grounds, including the location of all trees, bushes, roads, fences, gates and other landscape features. Note the location and orientation of each gravestone, mausoleum and crypt. Assign each physical feature (i.e. headstones, footstones, fences, benches) a control number that will tie together the written records, photographs and maps.
2. Make a written record of each gravestone on a survey form. This form should include the control number, recording date, type of gravestone (headstone, footstone, crypt, obelisk, etc.), size of marker, description of gravestone material (limestone, granite, marble, concrete, iron, etc.), condition of the gravestone, name of the deceased, vital dates, description of carving, maker's marks, exact inscription and any other identifying characteristics. Create a survey form for vegetation and landscape features as well.
3. High-resolution, full color, digital images of each gravestone and other features should be included in the documentation. Rename each photograph with the control number. Make sure to plan ahead for long-term archival storage of the images.
4. Make multiple copies of the documentation. Store them in varying locations using multiple formats.

SET GOALS

Once all gravestones and features are recorded, define your goals. Do you want to restore the cemetery completely, and if so, to what period? Do you want to preserve the cemetery by cleaning up the grounds and resetting the gravestones?

The following are definitions of treatments that may be considered for historic properties:

- Stabilization: Reestablishing the structural stability of an unsafe or deteriorated cemetery while maintaining its essential form.
- Preservation: Sustaining the existing form, integrity and material of a cemetery.
- Restoration: Accurately recovering the form and details of a cemetery and its setting as it appeared at a particular period of time.

Regardless of the approach, here are recommended guidelines:

1. Identify all features, materials, spaces and spatial relationships that are important in defining the historic character of the cemetery. Features can include gravestones, sculpture, curbing, fences, walks, roads, lights, benches, fountains, pools, land forms (terracing, berms, grading) and vegetation (trees, shrubs, other historic plant material).
2. Preserve distinguishing original qualities that reflect the integrity of the cemetery. Avoid removing or altering any historic material or distinctive landscape feature.
3. Recognize that landscape features are products of their own time. Alterations which have no historic basis and which seek to create an earlier appearance should be discouraged.
4. Recognize that changes over time are evidence of the history and development of the cemetery. These changes may have acquired significance in their own right, and this significance should be respected.
5. Repair, rather than replace, deteriorated cemetery features when feasible. If replacement is necessary, match the material being replaced with similar composition, design, color, texture and other visual qualities. Replacement of missing features should be substantiated by historical, physical or pictorial evidence rather than by relying on conjectural designs or on elements copied from other cemeteries.
6. Use the gentlest means possible to clean the surfaces of features in the cemetery. Avoid sandblasting and other cleaning methods that will damage historic materials.
7. Plan new construction so it will not destroy the historic character of the site. Differentiate new elements from the old, but ensure they are compatible with the general massing, size and scale in order to protect the historic integrity.
8. Make every reasonable effort to protect and preserve archeological resources, including graves, affected by or adjacent to any proposed work.

DEVELOP A SCOPE OF WORK

Once the goals have been established, developing the scope of work is the next step.

- Define the work to be accomplished, determine if the work should be phased and establish a time frame.
- Estimate the cost of each phase.
- Determine if professionals will be required (historic architect, object conservator and/or landscape architect).
- Establish the number of volunteers needed to accomplish certain tasks.

In this way, everyone associated with the project will know how long it will take, what the anticipated results of each phase will be and what the final product will accomplish.

DEVELOP A MAINTENANCE PLAN

It is very important that a maintenance plan is developed to determine when and how certain tasks need to be accomplished. This should include regular inspections of the monuments, walls and fences, and include guidelines for care of vegetation (i.e. mowing, trimming around stones and pruning).

Access additional cemetery preservation guidance at www.thc.texas.gov/cemetery.

Texas Historical Commission
Cemetery Preservation Program
P. O. Box 12276
Austin, TX 78711-2276
512-463-5853
history@thc.texas.gov

TEXAS HISTORICAL COMMISSION
REAL PLACES TELLING REAL STORIES

Locating Unmarked Graves

Introduction

This guide is intended to help cemetery caretakers, stewards, and the general public understands the options that exist for locating unmarked graves. The most common ways of locating graves are discussed, as well as their advantages and disadvantages. It should be noted that no process is foolproof in finding unmarked graves. There are specific laws related to the protection of graves in Texas. Please see the National Historic Preservation Act (NHPA) of 1966, as Amended, the Antiquities Code of Texas, The Texas Health and Safety Code, Chapter 711, and the Native American Graves Protection and Repatriation Act (NAGPRA).

In cemeteries what you see on the surface does not always reflect what is below. For instance, gravemarkers can be at the head, foot, or center of a grave, or can be some distance from the grave. Burials can be oriented in any direction relative to a marker or nearby burials. The markings on the gravemarker may face towards or away from the burial. Multiple individuals may be buried under one marker. Burials may lack markers, perhaps due to cultural traditions, deterioration of original gravemarker material, or desecration. Markers may also be situated over empty graves. if there is a depression, it may be larger or smaller than expected. Depressions do not always indicate graves, since cemetery workers can borrow soil from one area to fill in low spots in another, creating depressions that may resemble graves. It is not a safe assumption, therefore, that surface conditions indicate what may or may not be below the surface. Where records are inadequate, some sort of remote sensing or subsurface testing is needed to locate burials. Described here are the most common techniques.

Rod probing

One of the most common ways to search for graves is to probe the soil in the area with a 6-foot long rod with a blunt end and a T-shaped handle. These rods can be purchased commercially or be made by the user. The soil is probed in various spots looking for the resistance one would expect from a coffin or vault or an area of less compact soil resulting from the presence of a grave shaft.

> **Advantages:** Inexpensive, easy to use, generally accurate for recent burials in coffins or vaults.
> **Disadvantages:** Invasive, some families may object. Cannot typically find burials that were not in coffins. Cannot find wooden coffins that have rotted, which is very common among graves from the 1800s and early 1900s. The coffin and remains decay and the coffin void fills in, leaving no resistance or voids to be found by the probe. Very difficult to find small coffins of infants or children. Rocks in the soil often give false readings, and it is very difficult to probe when the ground is hard or frozen. May still require ground-truthing by scraping or some other method.

Soil coring

A more-exact method of probing is soil coring, in which a 3/4-inch or 1-inch diameter hollow tube is inserted into the ground above a suspected grave. The core is pulled out, and the soil examined for evidence of disturbance through comparisons with nearby undisturbed areas. This work should be done by a trained archaeologist or soils scientist, since the differences between a disturbed and undisturbed soil can be very subtle, especially if the soil is homogenous or very complex.

> **Advantages:** better than rod probing, since it can detect burials even if the coffin is severely decayed. Cost is usually less than remote sensing. There are numerous qualified archaeologists in Texas who can help; a link to a list of Texas archaeology firms can be found at the end of this document.

Disadvantages: Invasive, so families may object. Requires an archaeologist or soils scientist, so cost is greater than rod probing. Difficult or impossible in rocky soil. Often, soil difference can be so subtle that even a trained archaeologist cannot tell if a grave exists for certain or not, especially if the original soil matrix is very homogenous or if the upper soil layers are disturbed by nongrave activity such as earth moving or burrowing animals. It is very difficult to core when the ground is hard or frozen. May still require ground-truthing by scraping or some other method.

Scraping/formal excavation

The most definitive way of determining if a burial exists in a plot is formal excavation or scraping. This is different from grave digging; typically a grave digger will not notice if they are digging an occupied grave until it is too late and the coffin or burial is damaged or destroyed. Human remains are occasionally found in back dirt or borrow piles at cemeteries, since grave diggers cannot always tell if they have gone through an existing grave. In contrast, formal excavation is the systematic removal of soil in a controlled fashion to locate suspected graves while causing minimal damage to them. Formal excavation is best performed by a trained archaeologist who has an understanding of soils and excavation methods. While there are many ways to perform formal excavation, a common way is to use a wide, toothless backhoe to slowly strip away the soil in level layers a few inches at a time. This allows the archaeologist to check for evidence in the soil of a grave shaft (the filled-in grave hole) above the burial. Once evidence of a burial is encountered, archaeologists can map the burial and leave it in place. This is often referred to as scraping. Formal excavation/scraping most commonly stops well above the grave if there is evidence of a shaft. This is often the method required for ground-truthing other types of grave location techniques.

Advantages: Almost fool-proof and, if properly done, will provide a definitive answer. Can be performed in any soil type, rocks are not a problem. If other methods will require ground-truthing, scraping first will be a cost savings. There are numerous qualified archaeologists in Texas who can help; a link to a list of Texas archaeology firms can be found at the end of this document.
Disadvantages: Invasive, so families may object. Expensive; it requires an archaeologist and machinery (though less expensive than a geophysical survey followed by scraping to ground-truth). There is always a chance that a very ephemeral burial will be missed and destroyed by machinery, although this is highly unlikely.

Ground-penetrating radar (GPR)

With GPR, a radar wave is sent into the ground and the reflected signal is recorded. The time it takes for the signal to return reflects the depth of penetration, and the returning signal can be stronger or weaker depending on the type of material it is passing through and reflecting off. This data can be used to make an image of the subsurface. A GPR technician will move an antenna over an area, recording data. This data is then processed in a computer to create a two- or three- dimensional image of the subsurface. Under ideal conditions, the grave shaft and possibly the coffin or vault will be visible, but under even the very best normal conditions, only the upper part of the grave shaft may be visible. May still require ground-truthing by scraping or some other method.

Advantages: GPR is non-invasive, so families typically do not object. Under ideal conditions, it can provide a highly-detailed image of the subsurface. GPR is probably the best form of remote sensing if the clay content of the soil is low and the surface conditions are favorable. Geophysical practitioners can be found by contacting one of the archaeologists on the list referenced below.
Disadvantages: GPR's effectiveness depends greatly on soil conditions; it does not work well in clay-rich, rocky, or saturated soils. Success also depends on surface conditions and vegetation. GPR can be expensive and often requires some form of ground-truthing.

Resistivity

Resistivity can often be useful in finding graves, it is based on the principle that soils have differing moisture retention properties and therefore conduct electricity differently. A small electric charge is run between spikes

placed in the ground, and the resistance is measured. When a soil is disturbed, as in a burial, different types of soil are brought near the surface which has very slight differences in electrical resistivity. The surveyor will probe at close intervals over a large area collecting data, which is then downloaded into a computer to show areas of disturbed soils. In a cemetery, these often correspond to marked and unmarked graves.

Advantages: The spikes only penetrate a few inches into the soil, so it is relatively non-invasive and families typically do not object. Can give some idea if disturbances are deep or not. Under ideal circumstances, resistivity is quite effective. Geophysical practitioners can be found by contacting one of the archaeologists on the list referenced below.
Disadvantages: Resistivity is ineffective if the upper level of soil is disturbed over a large area (for example, by previous bulldozing), and it is ineffective under certain conditions, such as when the soil is very wet or very dry. Can be expensive. May be adversely affected by rocky soil. May still require ground-truthing by scraping or some other method.

Conductivity
Conductivity is often effective in finding graves. It works by applying a magnetic field to the ground surface. This magnetic pulse causes the soil to generate a secondary magnetic field, which is recorded to make a map. When a soil is disturbed, as in a burial, different types of soil are brought near the surface which have very slight differences in conductivity. The surveyor will walk an instrument over a large area collecting data, which is then downloaded into a computer to show areas of disturbed soils. In a cemetery, these often correspond to marked and unmarked graves.

Advantages: Conductivity is non-invasive, so families typically do not object. Can cover a large area in a fairly short period of time. It can be very effective under the proper conditions. Suitable instruments are often available from local soil scientists, but one must be certain the operator understands how to identify variation associated with graves. Geophysical practitioners can be found by contacting one of the archaeologists on the list referenced below.
Disadvantages: Conductivity is ineffective if the upper level of soil is disturbed over a large area. It is ineffective in the presence of ferrous metal (iron, steel, etc.), so the survey area has to be very clean and checked with metal detectors; metal markers, vases, etc., must be removed. It can be less effective if the soil is saturated, very dry, or rocky. It is affected by nearby power lines. May still require ground-truthing by scraping or some other method.

Magnetometry
In some circumstances, magnetometers can be an effective way to quickly identify the location of graves. Magnetometers are devices that measure minute changes in the magnetic properties of soil. When a soil is disturbed, as in a burial, different types of soil are brought near the surface which have very slight differences in magnetism. The surveyor will walk a magnetometer over a large area collecting data, which is then downloaded into a computer to produce maps that show areas of disturbed soils. In a cemetery, these often correspond to marked and unmarked graves.

Advantages: Magnetometry is non-invasive, so families typically do not object. Can cover a large area in a fairly short period of time. Can be very effective under the proper conditions. Geophysical practitioners can be found by contacting one of the archaeologists on the list referenced below.
Disadvantages: Magnetometry is ineffective if the upper level of soil is disturbed over a large area. Soils need to have significant iron oxide content, or it will not work. Ineffective in the presence of ferrous metal (iron, steel, etc.), so the survey area has to be very clean and checked with metal detectors; metal markers, fences, vases, etc., must be removed. Because of its limitations, Magnetometry can be less effective than conductivity or resistance. Magnetometry can be expensive. May still require ground-truthing by scraping or some other method.

Dowsing/witching

A common way to search for graves is dowsing, or as it is frequently called, "witching," or occasionally "divining". The dowser walks over an area with two copper wires or rods bent in an L shape, holding the short ends in each hand and pointing the long ends forward. Dowsers believe the wires will cross over a grave. This practice is ultimately derived from an old English and German folk belief that willow or hazel sticks have an uncontrollable desire for water and will point to underground reservoirs. In America, the willow was replaced with copper rods and used not only to find water, but also graves. One common folk belief is that the two rods will converge if the grave is of a male, and diverge if it is female. Supposedly the magnetic properties of disturbed soil or coffin hardware attract the copper rods. However, this is illogical. First, soil and coffin hardware do not attract metal, as simple experimentation will show. Soil is so weakly magnetic that a hyper-sensitive magnetometer is required to measure it reliably. Second, even if soil or coffin hardware were strongly magnetic, they would not attract copper wire, which is unaffected by magnetism–experimentation at home will show that you can't move a copper wire or penny with a magnet. Third, even if soil or coffin hardware were magnetic, and non-copper rods were used, the rods would *never* cross when exposed to a magnetic field; long metal objects always run *parallel* with strong magnetic fields. Remember the grade-school science project with iron filings on a glass plate over a magnet? The filings line up parallel and curve with the field, they do not cross each other. All credible scientific trials of dowsing have shown that dowsing is no better than random luck or commonsense intuition at finding graves or water (for further information, refer to Robert Todd Carroll's reviews of scientific tests of dowsing in the Skeptic's Dictionary [John Wiley & Sons, 2003], www.skepdic.com/dowsing).

> **Advantages:** There are no advantages to dowsing.
> **Disadvantages:** Dowsing is no better at finding graves than common-sense intuition. Dowsing could put yourself or your organization at legal and financial risk and could lead to public embarrassment. When you make determinations about the presence or absence of burials in a plot you are making decisions about other people's property which carries legal and financial liabilities. Since there is no scientific basis behind dowsing it will likely not be legally defensible. While other technologies and methods described here are not foolproof, they can at least be explained and justified in court because they are based on scientific or observational principles.

How to contact archaeologists and geophysicists (remote sensing practitioners):

A full list of qualified archaeologists working in Texas is maintained by the Council of Texas Archeologists on their website. View the contractors list at: www.c-tx-arch.org.

This guide was based on a publication of the Iowa Office of the State Archaeologist

Cemetery Contractors List

The Cemetery Preservation Program provides this list for informational purposes only. The list is not exhaustive, **nor does it constitute an endorsement of the consultants listed**. We suggest that you obtain information from several consultants so that you can make cost comparisons and assess the full range of available services. Contact Jenny McWilliams at jenn.mcwilliams@thc.texas.gov with any questions or comments you may have about this list.

Forming a Cemetery Association

There are several entities that can help you through the steps to forming a cemetery association. These links may be helpful, or you may seek help from a local community college's center for nonprofits.

Texas Association of Nonprofit Organizations

Austin Community College's Center for Nonprofit Studies

Texas Community Building with Attorney Resources (Texas C-BAR Forming a 501c3 Cemetery Organization

Headstone Repair

Texas Cemetery Restoration, LLC

Dan Kieninger (214) 476-8654

Rusty Brenner (214) 686-0014

dan@texascemeteryrestoration.com

www.texascemeteryrestoration.com

Mike Rowlands (Michelangelo)

214-490-7979 SavingHistory1991@gmail.com

Lowell Herzog - Note: Lowell may not be accepting new work. Please consult his website.

http://www.texasgravestoneconservation.com/

979-836-7715 herzogtamu89@gmail.com

Workshops

Rusty Brenner

(214) 686-0014 www.texascemeteryrestoration.com

Lowell Herzog

http://www.texasgravestoneconservation.com/

979-836-7715 herzogtamu89@gmail.com

Cemetery Mapping and Plot Inventory

Rusty Brenner

(214) 686-0014 www.texascemeteryrestoration.com

Online listing of cemetery management software:

https://www.capterra.com/cemetery-software/

Texas State University Department of Anthropology

Contact Dr. Todd Ahlman: t_a57@txstate.edu

The Association for Gravestone Studies has a list of various cemetery database products. Click on the "Vendor's Corner" option.

The International Cemetery, Cremation and Funeral Association has links to a wide variety of vendors on their website. Select the "Business Services" and/or "IT/Internet Services" category for software vendors, kiosk vendors, and web-based apps.

The Texas Cemeteries and Crematories Association carries news from product vendors, including at least one mapping vendor.

See also Archeological Investigations, below

Attorneys

Craig Albert calbert@cplalaw.com (Dallas)

B. F. Hicks (bfhicks@peoplescom.net) (Mt. Vernon and Franklin Co. Historical Commission)

Lindsey Peebles (lindsey@lpeebleslaw.com) (Austin)

The State Bar's lawyer referral service: https://www.texasbar.com/AM/Template.cfm?Section=Lawyer_Referral_Service_LRIS_ From their website: "The lawyer we refer you to will provide you with a 30 minute consultation for no more than $20. "The LRIS does not have any participating attorneys who offer free or reduced fee legal assistance. After the initial consultation, you should be prepared to pay a reasonable fee should you and the attorney decide to work together. Those fees will be determined by an agreement between you and the attorney. Make sure you understand completely what your lawyer will be charging you. If you are in need of free or low cost legal assistance, please visit www.TexasLawHelp.org for a listing of available resources in your county."

Cemetery Fencing

Please consider researching appropriate fencing as your choice can either maintain or drastically change the character of the cemetery and surrounding landscape

Standards for Preservation of Historic Cemeteries

Illinois FAQ Cemetery Fencing

Georgia DNR-HPD's Metal Work in Historic Cemeteries

Chicora Foundation's Cemetery Ironwork

Fencing Suppliers

American Fence & Supply Co. Galveston, TX

http://www.afence.com/

Texas Iron Fence & Gate Co. Decatur, TX

http://texasfenceandiron.com/

Find a Conservator:

The American Institute for Conservation and the Foundation for the Advancement of Conservation provide a "Find a Conservator".

https://www.culturalheritage.org/about-conservation/find-a-conservator

Remote Sensing (GPR/Mag)

BOB Hydrographics, LLC

Robert Gearhart

512-517-8564

Integrated Environmental Solutions

Kevin Stone, MA, RPA

(972) 562-7672 kstone@intenvsol.com

Rusty Brenner

(214) 686-0014 www.texascemeteryrestoration.com

Sidekick Ground Penetrating Radar Services

J. Michael Martin, PhD 979-218-5153

https://sidekickgpr.com/

Texas State University Department of Anthropology

Contact Dr. Todd Ahlman toddahlman@txstate.edu

Wood Inspection Services (Dallas area)

Stan Wood

http://weinspecttexas.com/cemetery-mapping/

Omega Mapping Services (Georgia)

James Plunkett (478) 747-3747 len@omegamapping.com

Archeological Investigations

A listing of archeologists can be found on the Council of Texas Archeologists webpage link below. It is recommended that you search the document for words such as cemetery, burial, and/or archival research:

https://counciloftexasarcheologists.org/Contractors-List

Rick Schroder

From: Dan Kieninger <dan@texascemeteryrestoration.com>
Sent: Monday, March 27, 2023 2:45 PM
To: Rick Schroder
Subject: RE: James Polk Johnson Cemetery
Attachments: 20230327 James Polk Johnson Cemetery GPR proposal.pdf; Bowman Ridge Cemetery GPR Survey Report 2022-0722.pdf

Rick:

Attached is our proposal for conducting a Ground Penetrating Radar (GPR) survey at James Polk Johnson cemetery to see if there are any possible unmarked burials. I have also attached a report from a recent project to give you an idea of the deliverables. I also want to mention that we will mark our findings in the cemetery with a flat stainless steel disc so that you will be able to find the unmarked burials in the future.

If you have any questions please let me know.

Thank you and we look forward to hearing from you.
Dan

From: Rick Schroder <rschroder@johnsoncitytx.org>
Sent: Wednesday, March 22, 2023 4:44 PM
To: Dan Kieninger <dan@texascemeteryrestoration.com>
Subject: James Polk Johnson Cemetery

Mr. Kieninger –

The City of Johnson City owns the James Polk Johnson Cemetery located near the intersection of N. Ave. L and W. Pecan Dr. I believe it is a recognized historical cemetery through the Texas Historical Commission:

Details for unknown (Johnson City) (Atlas Number 7031004305)
Cemetery — Atlas Number 7031004305

James Polk Johnson Cemetery:
The resting place of James P. Johnson (1845 - 1885) and family. James Johnson's homestead was selected as the site of the City of Johnson City in 1879. In 1890, the newly formed community became the Blanco County seat.

Marker Text:
(August 24, 1845-October 20, 1885) A native of Georgia, James Polk Johnson came to Texas with his family and grew up in DeWitt County. Following his service in the Confederate army during the Civil War, he moved to Blanco County to join his uncles in the cattle business. He bought the business in 1871 and became successful in his own right. In 1879 he founded a new town, Johnson City, on the Pedernales River and was instrumental in its development. His dream of making Johnson City the seat of Blanco County was not realized until 1891, six years after his death. Little did he know that the town that bears his name would someday also be known as the hometown of his cousin and 36th president of the United States, Lyndon Baines Johnson.

We are interested in restoring the premises / markers, mapping the cemetery and using ground penetrating radar to determine if unmarked graves exist on the property. Where should we begin?

The property can be found here:

https://goo.gl/maps/UxqBkJofcDoXftPB8

Where should we begin?

Best,

Rick A. Schroder
Chief Administrative Officer
303 E. Pecan Dr. (Physical) | P.O. Box 369 (Mailing) | Johnson City, Texas 78636
(830) 868-7111, Ext. 8 | (830) 868-7718 (Fax) | www.johnsoncitytx.org
Yesterday is not ours to recover, but tomorrow is ours to win or lose. – President LBJ

James Polk Johnson Cemetery GPR Proposal – 1 acre

Johnson City, Blanco Co. Texas

Rick Schroder – City of Johnson City
830-868-7111 ext 8
rschroder@johnsoncitytx.org

Submitted by

Texas Cemetery Restoration LLC

&

Consulting Archeologist and GPR Specialist

March 27th, 2023

Introduction

James Polk Johnson cemetery is located on the NE corner of the intersection W. Pecan Dr. and Ave L in Johnson City, Texas. The cemetery area is open with minor elevation change, and some trees. The cemetery area for GPR measures approximately 170 feet east-west and up to 190 feet north-south. The size in acres, taken from GPS mapping, is approximately 1 acres for both areas (**Drawing 1**). The purpose of the Ground Penetrating Radar (GPR) survey is to locate possible unmarked graves. GPR offers a robust methodology for the non-invasive investigation of graves, cultural resources and buried utilities.

About GPR

Ground Penetrating Radar (GPR) has grown in popularity in usage on cemeteries and on archeological sites (Conyers and Goodman, 1997:11). GPR involves the observation of the reflected component of transmitted electromagnetic waves into the subsurface. The reflections, unlike that of acoustical waves, occur at the interfaces of materials of differing electrical conductivity or permittivity. The depth of penetration for radar waves is frequency dependent and the attenuation of the radar wave in the ground is rather quick compared to that of seismic – a few meters compared to kilometers. Since many, if not most, buried features of archeological interest are not deeply buried; the GPR has utility in the search and characterization of these features. GPR is characterized as a WYSIWIG technique (i.e. what you see is what you get). The GPR output is a series of radar wavelet traces or scans produced on a chart recorder or computer screen as an antenna is pulled across the ground surface. The radar wave perturbations can directly yield reflection depth and the relative strength of the reflections, such that the form and

location of a buried object or feature can be ascertained rather readily. If the velocity of the radar waves can be determined, then the conversion of travel-time between the transmitter and receiver of the reflected wave, can be converted to distance, similar to that which is done in seismic studies. Indeed, the phenomenal advance of the high-resolution post-processing software, GPR_Slice, allows us to tease out the finest details as to stratigraphy and shape of subsurface reflectors or features in plan view, rather than the previous methods of solely vertical readings. GPR is not X-ray. For cemeteries, one will not see a skeleton in the ground. Instead, grave pits, grave excavation edges, and remnants of caskets if any, will be imaged. Interpretations about the presence of absence of human burials are drawn from the GPR imagery.

How the Survey will Proceed

The portion of James Polk Johnson scheduled for GPR examination will be gridded in 2 foot line intervals. The area to be gridded totals approximately 43,560 sqft. GPR transects separated by 2 feet will be pulled perpendicular to the existing graves. The dense line spacing should allow us to illuminate known and unknown graves. We will use a GSSI utility scan digital radar system and a 350MHz antenna. GPS will record the exact location and position of each GPR transect line. Clear weather is required for this work. The area to be surveyed must be mowed no more than a week before the field work is conducted. All tree limbs shall be pruned 7 feet above grade.

Upon completion of the field survey, the GPR data will be downloaded and post processed in GPR-Slice software.

Deliverables

The client will be provided with the following products:

- A report detailing our findings.
- 2D maps showing buried anomalies with a high probability of being graves
- Installation of stainless steel discs at locations of unmarked burials up to 100 burials then it will cost $4 each additional burial.

Costs

Ground Penetrating Radar (GPR)	**$5,800**

Rusty Brenner (214) 686-0014 rusty@texascemeteryrestoration.com

Daniel Kieninger (214) 476-8654 dan@texascemeteryrestoration.com

Location of GPR survey in the highlighted area:

Rusty Brenner (214) 686-0014 rusty@texascemeteryrestoration.com

Daniel Kieninger (214) 476-8654 dan@texascemeteryrestoration.com

Example

Geophysical Survey at Bowman Ridge Cemetery

Report Submitted To:

Bowman Ridge Cemetery Association
Attn: John and Mary Rhoads

July 22, 2022

Texas Cemetery Restoration LLC
1710 SE Loop 304
Suite 200
Crockett, Texas 75835
www.texascemeteryrestoration.com

214.686.0014
214.476.8654

Introduction

Texas Cemetery Restoration collected approximately 1.2 acres of Ground Penetrating Radar (GPR) data at Bowman Ridge Cemetery in Erath County, Texas. A total of fourteen (14) possible unmarked graves were located within the survey area (Attached map). The coordinates of the unmarked graves are presented in Table 1. These coordinates are in Latitude and Longitude.

Geophysical Survey Investigations in Archaeology

Geophysical survey investigations have become an important part of the pursuit of North American archaeology and employ a range of techniques for the non-destructive prospecting of archaeological deposits (Gaffney and Gater 2003; Kvamme 2008). Several techniques have been derived from geophysical prospecting and adopted for archaeological investigations through rigorous field collection techniques and unique data processing programs specifically developed for the study of the archaeogeophysical record. (Clark 2000; Kvamme 2003). Techniques used mostly for archaeological research include soil resistivity, soil conductivity, magnetic susceptibility, magnetometry, and ground-penetrating radar (GPR) (Clark 2000; Kvamme 2003).

All produce different results and require different equipment. Magnetometers record the net sum of all magnetic fields, both induced and remnant; GPR records relative dielectric permittivity; and electromagnetic induction meters record both the conductivity of the soils as well as their induced magnetic properties (magnetic susceptibility). The geophysical instruments are differentially affected by variables such as moisture, metal trash or debris, and the transmission of signals such as cell phones and transmission lines. Data collection is also impacted differently for each of the geophysical instruments by physical impediments such as trees, pavement, fences, and vegetation. The different geophysical techniques that have been used in archaeology have been discussed in a number of seminal books and journal articles (Bevan 1998; Clark 1990; Conyers 2004; Gaffney 2008; Gaffney and Gater 2003; Scollar et al. 1990; Weymouth 1986; Witten 2006).

Ground Penetrating Radar

GPR is an active, non-invasive technique that uses a shielded surface antenna to transmit pulses of radar energy, generally high-frequency electromagnetic (EM) waves, that reflect off of buried objects, features, or geological bedding contacts and are detected using a receiving antenna (Conyers 2004:23-28). The waves detected by the receiving antenna are recorded in nano seconds (ns), which reflect the two-way travel time of the radar energy. Fairly accurate approximations of depth of recorded anomalies can be determined through velocity analysis (Conyers and Lucius 1996).

While GPR is one of the more widely used techniques in archeological geophysics, its success, like that of the other archeological geophysics techniques, is largely based on such site conditions as soil type, sediment mineralogy, and moisture content (Conyers 2004; Kvamme 2003). For example, ideal soil types for GPR include dry homogenous soils with minimal clay. On the other extreme, radar energy will become attenuated more quickly in more conductive mediums such as clay and poorly drained soils or in mediums with high magnetic permeability (Conyers 2004).

When site conditions are appropriate, GPR has been shown to be one of the most effective geophysical methods for locating unmarked graves and delineating historic cemeteries (Conyers 2004). GPR can be employed to detect the buried coffin or vault as well as disturbed soils related to the burial activities (i.e., the grave shaft) and possible reflections from other remains of the burial (i.e., coffin hardware, grave goods, voids). **The presence of false negative results are always possible, even in soils with good signal penetration. GPR cannot be used as the sole technique for determining the presence or absence of unmarked graves. Ground based manual excavation is always needed to "ground truth" GPR data.**

GPR Data Processing

The initial data processing involved the generation of amplitude slice-maps (Conyers 2004). Amplitude slice-maps are a three-dimensional tool for viewing differences in reflected amplitudes across a given surface at various depths. Reflected radar amplitudes are of interest because they measure the degree of physical and chemical differences in the buried materials. Strong, or high amplitude reflections often indicate denser buried materials, such as burials. Amplitude slice-maps are generated through comparison of reflected amplitudes between raw vertical profiles. In this method, amplitude variations recorded as digital values are analyzed at each location in a grid where there is a reflection recorded. The amplitudes of all traces are compared to the amplitudes of all nearby traces along that profile. This database can then be "sliced" horizontally and displayed to show the variation in reflection amplitudes at a sequence of depths in the ground. The produced result is a map that shows amplitudes in map view, but also with depth. Often when this is done, changes in the soil related to disturbances such as burials become apparent, making them visible to the human eye.

From the original dzt files (raw data), a series of image files were created for cross-referencing to the amplitude slice-maps that were produced. Two-dimensional reflection profiles are analyzed to determine validity of the features identified on the amplitude slice-maps. The reflection profiles show the geometry of the reflections, which can lend insight into whether the radar energy is reflecting from a flat layer (seen as a distinct band on profile) versus a single object or burial (seen as a hyperbola in profile). Using these profiles to confirm or refute ideas about the nature of buried materials seen in the three-dimensional slice maps, unmarked burials were then delineated at the cemetery.

Unmarked graves are located by analyzing the individual GPR profiles (or radargrams). Unmarked graves can create many different types of signatures in profile. Their variation depends on several different factors including the age of the grave, the physical nature of the grave (coffin, vault, depth, and state of decay) as well as the soil conductivity (higher soil conductivity typically attenuates radar energy more quickly). Locating unmarked burials is done by plotting anomalies in the individual GPR profiles then projecting these points in autocadd. This allows you to see the overall pattern of anomalies. Groups of anomalies that fit known patterns – such as the east/west orientation of most cemeteries – are then used to help determine the presence or absence of unmarked graves. Unmarked graves that do not fit the overall pattern of a cemetery can be missed and objects that appear to fit the overall pattern of a cemetery can be mis-interpreted.

Survey Results

A total of fourteen (14) possible unmarked graves were recorded (Table 1 and attached map). Figure 1 is an example of a GPR profile with a grave legible in the data.

Figure 1. Interpretation of GPR data showing location of possible unmarked graves.

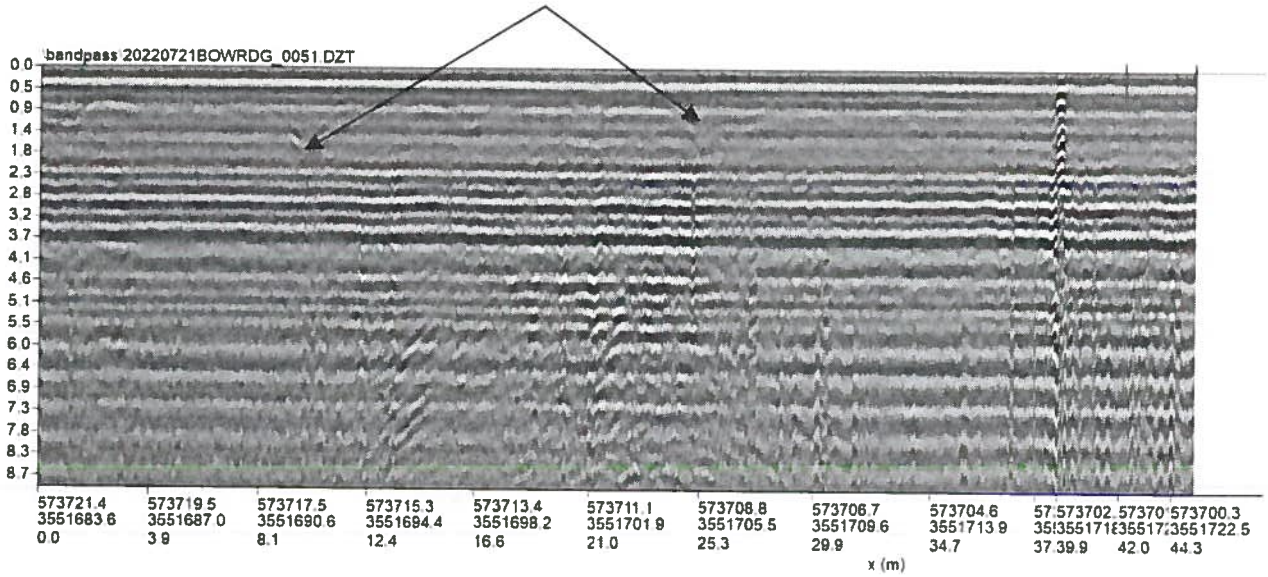

Table 1. Unmarked Grave Locations

GPR Label	LATITUDE	LONGITUDE
B7	32.09902381	-98.21886748
D4	32.09926123	-98.21882103
D6	32.09914276	-98.21873368
D7	32.09906071	-98.21870242
F5.1	32.0992919	-98.21867126
F5.2	32.0992598	-98.2186526
F6	32.09921738	-98.2186257
G4	32.09932984	-98.21862658
G5	32.09928371	-98.21860207
H7.1	32.09923018	-98.21843837
H7.2	32.09920191	-98.21841923
I5	32.09937712	-98.21847243
I6.1	32.09930069	-98.21842258
I6.2	32.09934097	-98.21840266

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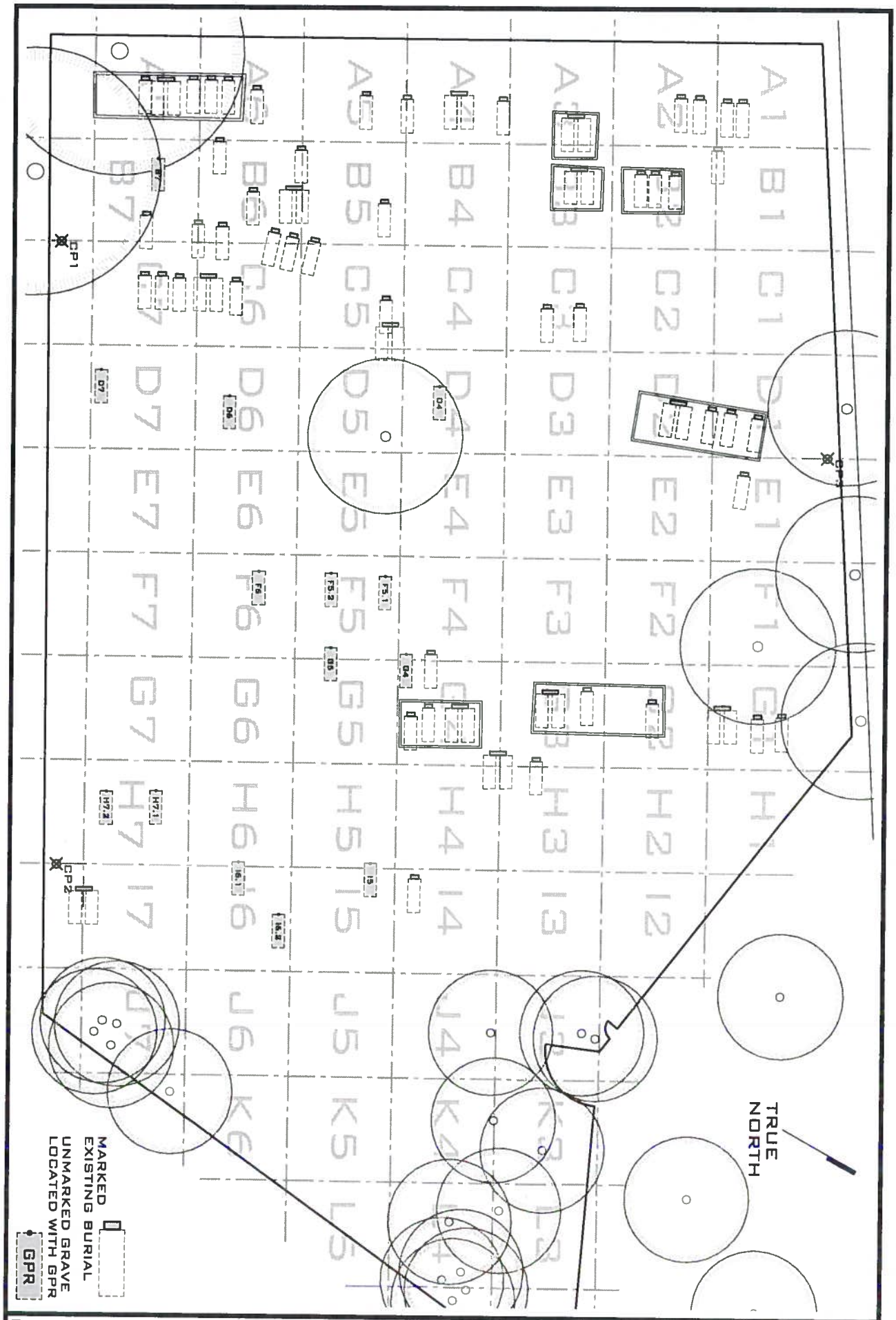

BOWMAN RIDGE CEMETERY

ERATH COUNTY, TEXAS

SECTION:
SCALE: 1" = 20'-0"

MAP DRAWN BY TEXAS CEMETERY RESTORATION LLC