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Management Summary: Archaeological Testing for Proposed Drainage Improvements at the Douglass Cemetery, Alexandria, Virginia

Prepared for:
Jacobs Engineering Group, Inc.
1851 Alexander Graham Bell Drive, #100
Reston, Virginia 20191

Prepared by:
Gray & Pape, Inc.
2119 E. Franklin Street
Terrace Level
Richmond, Virginia 23223

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May 5, 2024

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1.0 INTRODUCTION AND PROJECT OVERVIEW

Jacobs Engineering Group, Inc. (Jacobs) has been selected by the City of Alexandria to design and implement a solution to persistent drainage issues that cause standing water in the Douglass Memorial Cemetery following heavy rainfall events. The City has obtained one-quarter ownership of the property containing the Cemetery in the interest of preserving it as a historic resource. Gray & Pape, Inc. (Gray & Pape) was retained by Jacobs to conduct archaeological investigations within the project's proposed Limits of Disturbance (LOD) to delineate areas in which ground-disturbing activities will not be expected to result in impacts to burials. Archaeological investigations included the excavation of four trenches and two test units, detailed mapping of the excavations and nearby landscape features, artifact analysis, and artifact and document curation.

Fieldwork was conducted between January 22 and February 2, 2024 and was overseen by Joseph Balicki, MA, and Joseph Blondino, assisted by field technicians Claudia Abernathy, Julie Chlysta, Rayshelle Holloway, and Jordan Scott. Eleanor Breen, Garrett Fesler, and Benjamin Skolnik of Alexandria Archaeology provided insight and consultation throughout the project. Mapping and GIS support were provided by Jacob Lyons, who also produced many of the report graphics.

1.1 Project Area Overview

The Douglass Memorial Cemetery is located in Alexandria, Virginia, north of Wilkes Street and west of Payne Street in the northeastern portion of the Wilkes Street Cemetery Complex (Figure 1-1 and Figure 1-2). The project area itself lies along a footpath that runs roughly north-south through the central part of the cemetery. Beneath the path is an existing drainage pipe that is slated for replacement. East of the path is a low-lying and poorly drained area that experiences ponding following large rainfall events (Figure 1-3). An artificial berm marks the northern boundary of the cemetery and separates it from an open drainage ditch lying between the cemetery and an apartment building (Figure 1-4). The proposed project seeks to replace the existing drainpipe beneath the footpath, as well as to cut a channel through the berm in order to allow the frequently ponded area to drain into the open ditch to the north.

Figure 1-1
Project area location,
Alexandria, Virginia.

Project Area

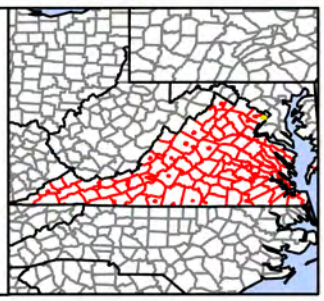

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Figure 1-2
Aerial imagery showing the project area and proposed trench in Alexandria, Virginia.

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Proposed Trench
Additional Workspace
Project Area

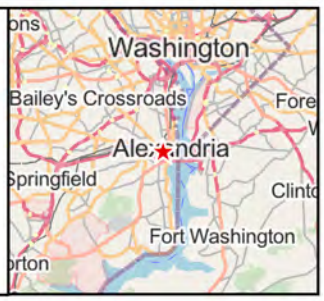

Figure 1-3. Ponding east of footpath, facing southeast.

Figure 1-4. Ponding east of footpath, facing northeast. Berm separating cemetery from open drainage ditch is visible beyond headstones.

2.0 FIELD METHODOLOGY

Fieldwork for this project comprised the excavation of four trenches and two test units, as well as the mapping of all excavations and any subsurface deposits or features encountered during excavation.

2.1 Trenches

Four trenches were excavated in locations established in consultation with Alexandria Archaeology staff. Each trench measured 3 feet (ft) by 15 ft (0.9 meters [m] by 4.6 m) and was excavated according to revealed stratigraphy. Excavation was terminated upon encountering the water table or deposits indicative of the extent of disturbance resulting from the installation of the existing drainpipe. All soils excavated from potential former ground surfaces were screened through ¼-inch (in) (0.6-centimeter [cm]) mesh hardware cloth, while obvious fill deposits, such as the gravel comprising the path through the cemetery, were sampled sufficiently to establish recent deposition and lack of artifactual material relating to interments. Measured profile drawings, accompanied by corresponding photographs, were made of at least one wall of each trench. Drawings and photographs in plan view were made as appropriate to record features. The location of each trench was mapped as described below.

2.2 Test Units

Two test units were excavated in locations established in consultation with Alexandria Archaeology staff. Each trench measured 3 ft by 5 ft (0.9 m by 1.5 m) and was excavated as described above.

2.3 Mapping

Mapping was conducted with a Nikon NPL total station coupled to a TDS Ranger data collector using SurveyPro software. A permanent datum was established at the site by driving a 1-ft (0.3-m) length of rebar into the ground west of the area of investigation. A backsight and control point were similarly marked to facilitate re-establishment of the mapping grid if required. The backsight was located at the base of a large tree approximately 128 ft (39 m) west of the datum, and the control point was placed approximately 127 ft (38.7 m) north of the datum. The datum was assigned the coordinates of N5000, E5000, Z100. Georeference points were taken on landscape features visible in aerial imagery to allow total station points to be overlaid onto existing mapping, and the datum, backsight, and control point locations were recorded using an Arrow 100+ GPS receiver linked to an iPad using FieldMaps software.

2.4 Laboratory Methods

All collected artifacts were processed at Gray & Pape's Richmond laboratory in accordance with the protocols outlined in the Virginia's State Collection Management Standards (2011) as well as Alexandria Archaeology's standards (Alexandria Archaeology 2021). Artifacts were washed, or otherwise cleaned as required by their state of preservation, and then sorted, labeled, processed by material type, and placed in appropriately labeled plastic bags. The initial steps in historical artifact analysis involved cataloging the assemblage. Data recorded on each artifact included form, material, functional classification, manufacturing technology, and attributes that are chronologically diagnostic. Material classifications were subdivided, where appropriate, to afford greater flexibility and detail of inclusive data. Standard typological methods were applied to characterize the historical artifact assemblages. Aultman et al. (2018a, b) and Magid (1984) provided the basis for the categorization. Upon completion of the project, all artifacts will be transported to Alexandria Archaeology in archival-grade materials.

Figure 2-1
Locations of mapping control points.

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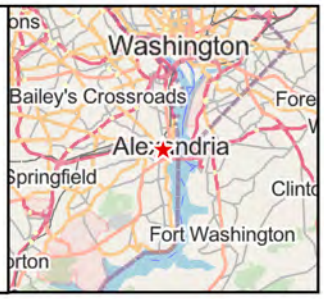
Datum
Backsight
Control Point
Project Area



3.0 RESULTS OF INVESTIGATIONS

Field investigations at the Douglass Cemetery involved the excavation of four trenches and two test units, as well as detailed mapping of the excavations and relevant landscape and subsurface features (Figure 3-1). The results of the study are presented in detail below, and a summary of previous work at the project location is offered.

3.1.1 Summary of Previous Research

To clarify the history of land use within the Douglass Cemetery, a review of relevant documents was conducted. This research, carried out largely by Benjamin Skolnik of Alexandria Archaeology, focused largely on mapping and aerial imagery.

The earliest map that shows sufficient detail in the vicinity of the Douglass Cemetery to be of interest is the 1862 United States Coast Survey map (Figure 3-2). This map shows the block bounded by Wilkes, Wolfe, and West Streets as empty, except for a single building at the northwest corner of the intersection of Wilkes and West. Apart from this single building, the only feature depicted on this block is a stream running roughly from southeast to northwest across the block. The presence of this stream is likely a major contributing factor in the block remaining largely undeveloped throughout much of the nineteenth century until the establishment of the Douglass Cemetery in 1895. A feature possibly representing this stream can also be seen in a Civil War-era photograph taken from the Orange & Alexandria Railroad roundhouse located near the intersection of Wolfe and Henry Streets, northeast of where the cemetery is now located (Figure 3-3). In the photo, a linear depression is visible just beyond the fence around the house in the southeastern corner of what would become the cemetery site.

Drainage issues apparently plagued the area around the Douglass Cemetery from an early date, as the "Local Brevities" section of the *Alexandria Gazette* from September 30, 1902 notes: "The work of laying sewer pipe on the northern border of Bethel cemetery for the purpose of carrying water across the roadway into the sewer running through the Douglass cemetery is being done under the supervision of Colonel Owens, engineer of Quartermaster's Department." This brief statement evidences a need to alleviate poor drainage issues in the Bethel Cemetery, located just across Wilkes Street from the Douglass Cemetery, and suggests that a storm sewer was already present within the Douglass burying ground at that time. It is likely that this was an open sewer, created through channelizing the natural drainage seen in the 1862 map. This work may have been done by 1865, as a map from that year shows the drainage traversing the cemetery as partially straightened and running essentially parallel with the north-south streets in Alexandria's grid system (Figure 3-4). This drainage appears to originate south of Wilkes Street and runs beneath the street into what was to become the Douglass Cemetery.

A topographic map from 1973 continues to depict the channelized drainage or open storm sewer running through the cemetery (Figure 3-5). It is assumed that the installation of the current drainage pipe occurred within this channelized drainage and may have involved simply placing the drainpipe into the existing drainage ditch. Assuming that is the case, the course of the current drainpipe pre-dates the creation of the cemetery and its installation may not have impacted any interments.

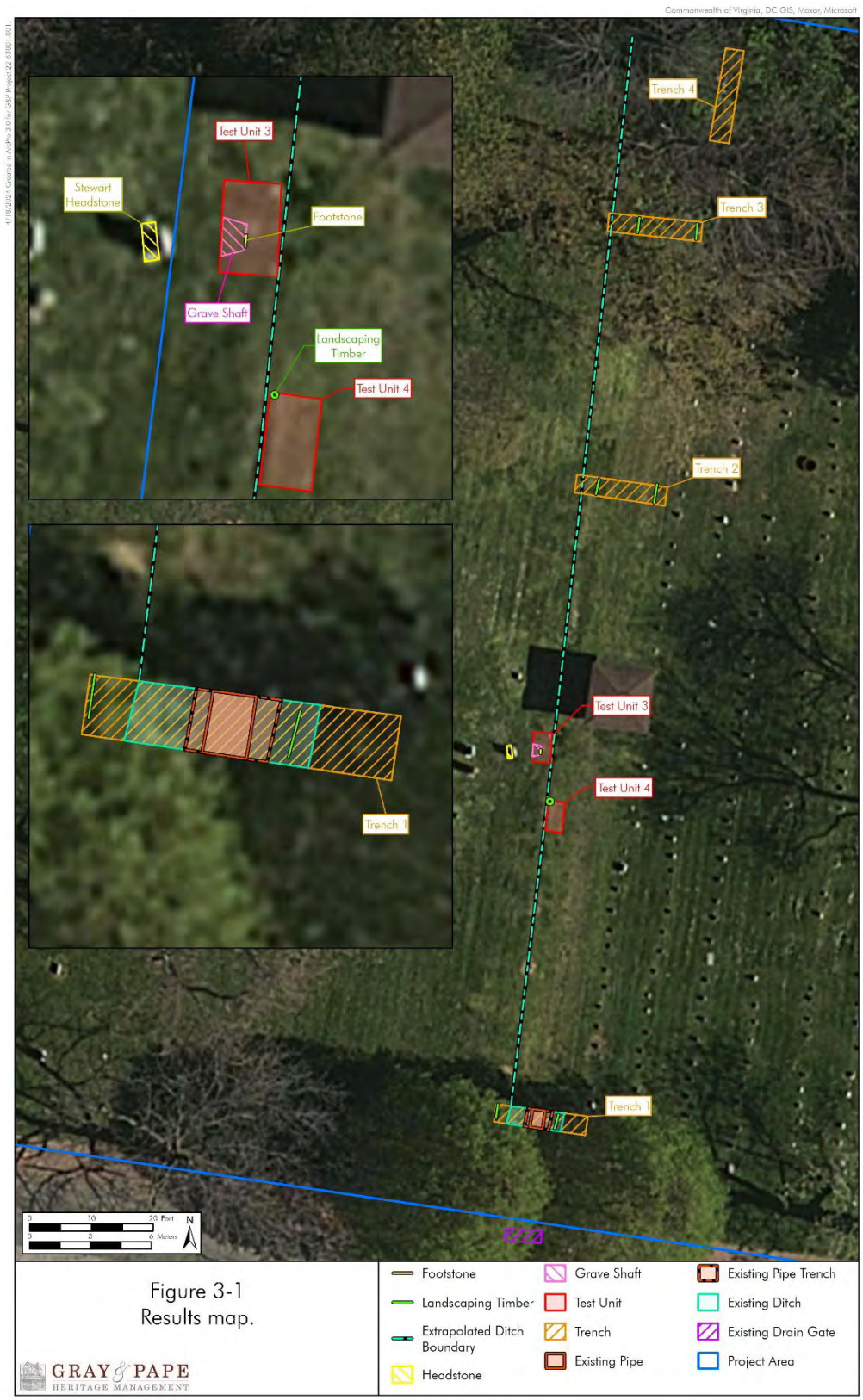


Figure 3-1. Results map.

Library of Congress, United States Coast Survey, Plan of Alexandria (1862).

4/18/2024 Created in ArcPro 3.0 for G&P Project 22-63801.001

Project Area

Figure 3-2
Project area on 1862 Plan of Alexandria.

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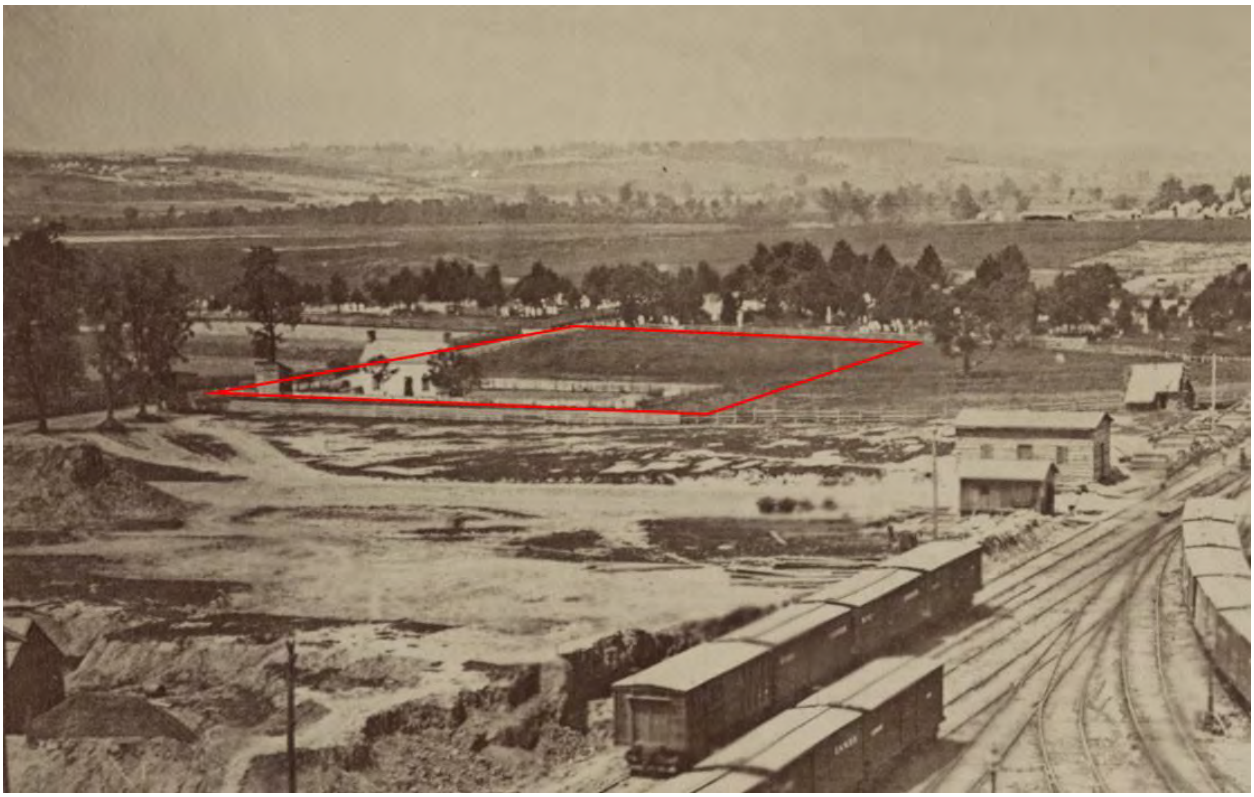

Figure 3-3. Civil War-era photo showing area that would later become the Douglass Cemetery (Russell n.d.). Approximate location of cemetery outlined in red.

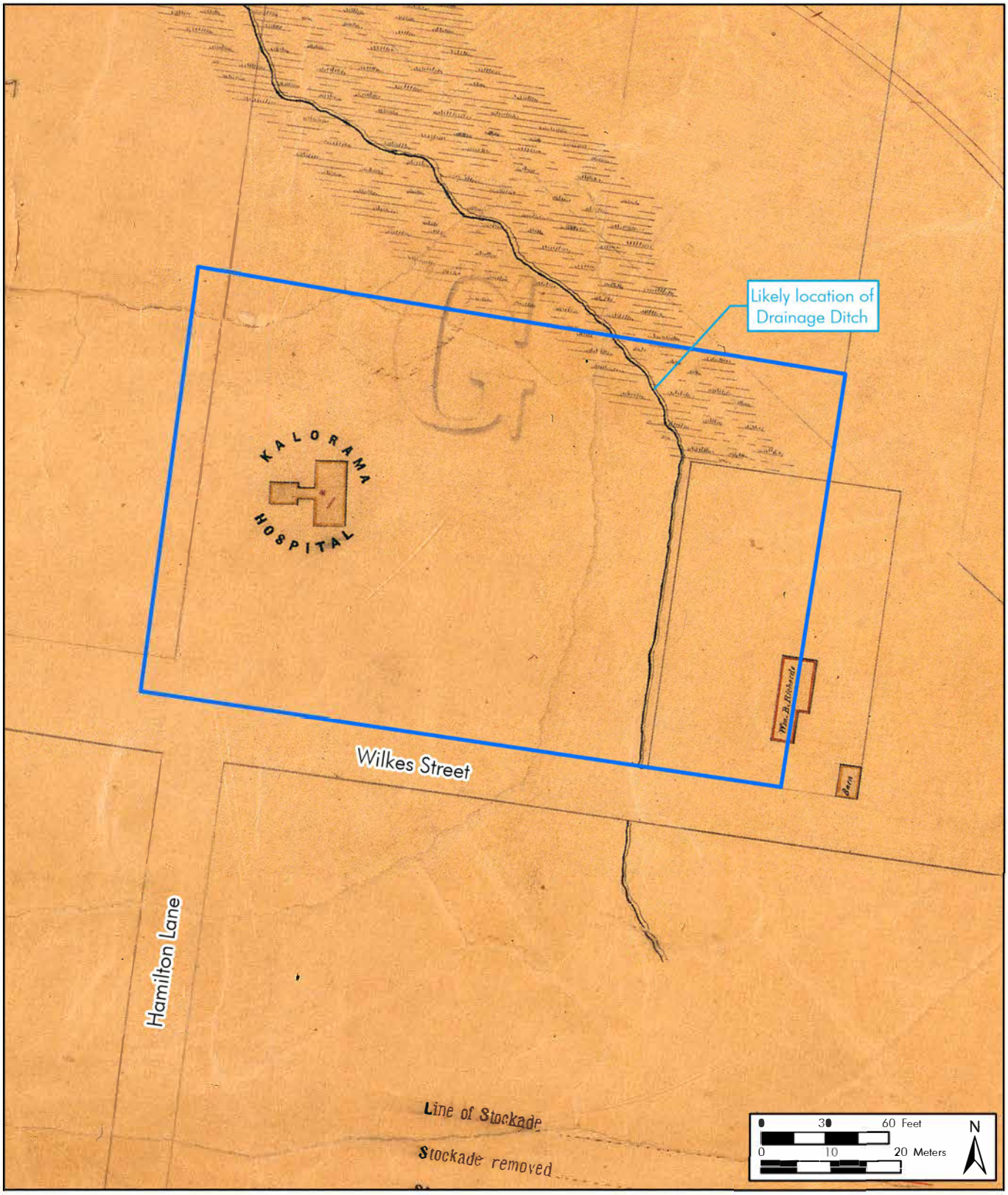

Figure 3-4
Project area on 1865 Map of the U.S. Military Railroad Station at Alexandria.

Project Area

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Figure 3-5
Project area on 1973
Topographic Map of Alexandria.

Project Area

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3.1.2 Previous Field Investigations

One previous archaeological investigation has been conducted in the portion of the Douglass Cemetery relevant to the current project. In late 2019, Rhea Engineers and Consultants, Inc. (Rhea) conducted non-invasive geophysical surveys within the cemetery on behalf of Alexandria Archaeology. Rhea's investigations made use of both ground-penetrating radar (GPR) and electromagnetic (EM) conductivity surveys (Johnson and Johnson 2019).

The results of the EM survey show significant variation in ground conductivity across the cemetery. However, a consideration of the EM data in conjunction with the results of the GPR survey did not reveal any obvious correlation between conductivity and GPR anomalies interpreted as possible graves. As a result, the EM data alone were determined to be insufficient to identify possible unmarked interments (Johnson and Johnson 2019).

The GPR survey resulted in the identification of circa 780 anomalies interpreted as possible or probable graves. The anomalies that were felt to potentially represent graves were sorted into four categories based on level of confidence in their interpretation:

- Probable vault or intact coffin;
- Well-defined grave;
- Probable grave; and
- Probable grave, smaller than a typical adult.

The latter two categories reflect the lowest confidence level that the anomalies in question represent graves. In addition to these categories, areas were also identified that contained multiple weak reflections that could not be defined individually. Ten anomalies were identified within the area proposed for the installation of the new drainage pipe. These comprise three anomalies interpreted as probable graves, six interpreted as probable graves, but smaller than a typical adult, one well-defined grave, and one discrete, near-surficial feature. The proposed test unit locations were chosen to investigate these anomalies. Only two of the planned test units were excavated because of the wet conditions at the time of the survey and the presence of water in some excavations.

3.1.3 Trenches

Three of the four trenches were oriented east-west, traversing the footpath through the cemetery (Figure 3-1). One of the primary goals of these trenches was to identify the horizontal and vertical boundaries of the disturbance associated with installation of the existing drainpipe. Because burials within the cemetery are located east of their respective headstones, it was assumed that the line of headstones east of the path represented a western boundary for burials in that portion of the cemetery. Thus, it was more critical to determine whether burials located west of the footpath extended eastward into the proposed LOD, and the western boundaries of the trenches coincided with or extended slightly beyond the western extent of the proposed LOD. The remaining trench was oriented north-south and intended to determine whether burials were present in the area of a proposed drainage channel through the berm on the cemetery's northern margin.

3.1.3.1 Trench 1

Trench 1 was excavated in the southern portion of the project area, just north of Wilkes Street. The purpose of this trench was to locate the existing pipe and determine the depth at which it was buried,

the horizontal extent of disturbance associated with its installation, and the nature of the overlying stratigraphy.

The uppermost stratum in Trench 1 comprised thin A horizon formed at the modern ground surface (Figures 3-6 and 3-7). Beneath this was a layer of gravel that caps the walking path through the cemetery, the edges of which are delineated by wooden landscaping timbers. A series of redeposited strata lie beneath the path gravel and represent earlier incarnations of the path, sediment washed into the space during rainfall event, or fill deposits capping the existing drainage pipe. On the western side of the trench, a series of redeposited strata seem to be related to a low artificial mound of unknown function that may represent attempts at diverting surface water to other areas of the surrounding landscape. Stratum VIII, which extended across the majority of the trench, was a layer of redeposited sand and cobbles directly overlying the existing drainage pipe. No similar soils were encountered in undisturbed contexts in any of the excavations, and this material may have been brought in from elsewhere following the installation of the pipe. Beneath this fill material is Stratum IX, which is also a fill, but appears to have been an active surface for long enough to have developed A horizon characteristics. It overlies Stratum XII, the apparent original ground surface. The existing drainpipe was encountered at the base of Trench 1, surrounded by Stratum XVI, a clean sand that served as a bedding material for the drainpipe. Two *in situ* bricks were encountered within Stratum XVI at the base of the excavation, just above the water table. The bricks were placed against the drainpipe and may have served to prevent it from rolling or shifting during excavation or to provide firm footing within the surrounding wet sand for workers installing the pipe.

Based on the stratigraphy revealed in Trench 1, the following sequence of events is proposed. The original, unmodified landscape within the project area featured a natural drainage, the banks of which are represented by Stratum XII. Sometime prior to 1865, this drainage was modified to flow within a straight channel running roughly parallel with the north-south streets in Alexandria's grid system. This modification of the landscape is represented by the deposition of the Stratum IX fill and resulted in the open storm sewer referred to during the fieldwork as the "ditch." The installation of the existing corrugated metal drainpipe was achieved by excavating a shallow trench, marked by Stratum XVI, into the bottom of the ditch to place the pipe into. The entire ditch was then covered with the Stratum VIII fill to achieve the present grade. The horizontal boundaries of the Stratum VIII fill thus approximate the edges of the circa 1865 ditch. Based on the artifact assemblage recovered from the strata overlying the existing pipe, and specifically a beer bottle found at the interface of Strata VIII and IX, the pipe appears to have been installed sometime in the mid to late 1970s.

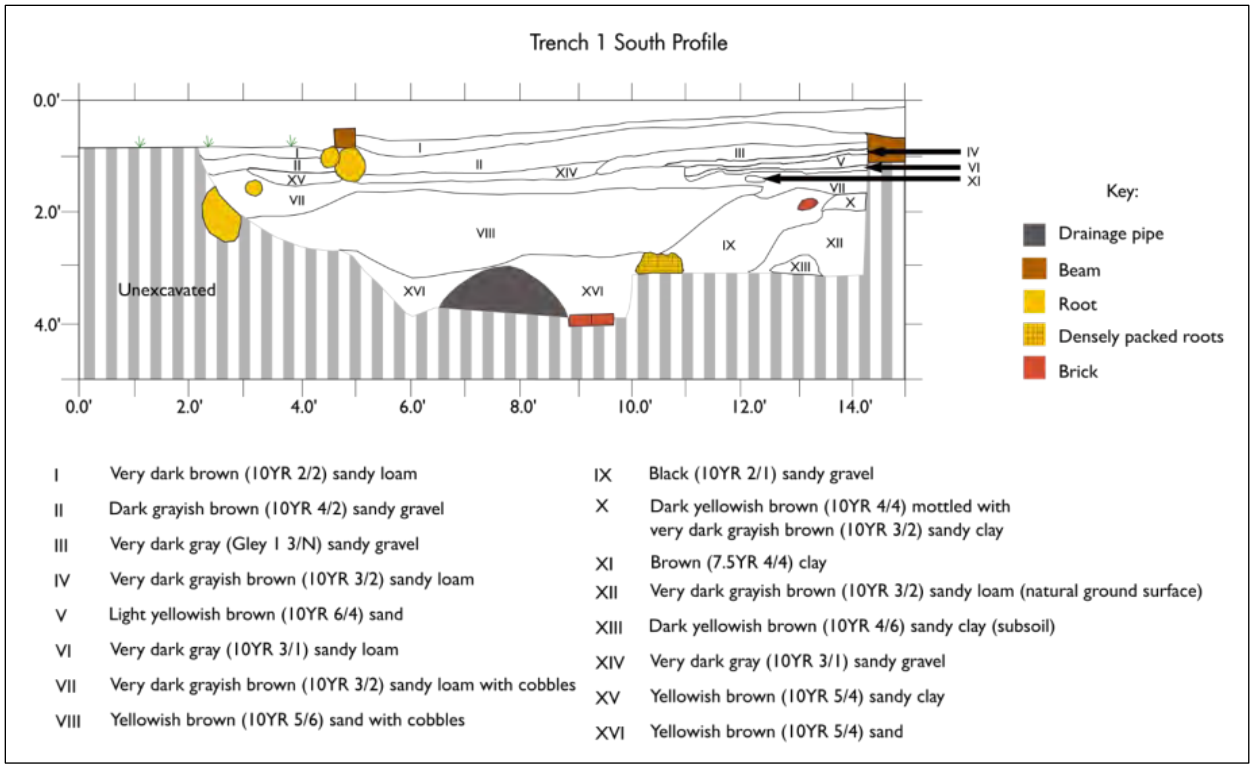

Figure 3-6. South profile of Trench 1.

Figure 3-7. Trench 1, post-excavation. Facing southeast.

A total of 75 artifacts was recovered from Trench 1. The assemblage comprised four pieces of unglazed terra cotta (at least two of which appear to be flowerpot fragments), a sherd of green-glazed earthenware, 44 fragments of twentieth-century bottle glass in various colors, two pieces of other glass, and 22 pieces of avian bone. Three of the artifacts came from the uppermost stratum, eight from Stratum II, 10 from Stratum III, and 53 from Stratum VII, an incipient A horizon formed in the top of the ditch fill. An intact beer bottle embossed with a date code for 1976 was also recovered from the interface of Strata VIII and IX.

The bottle recovered from the Stratum VIII/IX interface is a brown glass beer bottle with a screw-cap closure and embossed with the Anheuser-Busch logo (Figure 3-8). The bottle is an example of the "Mod-Handy" form introduced in 1964 (Schulz et al. 2019). The bottle's base features an "H" superimposed over an anchor, representing the Anchor Hocking Corporation, a major bottle manufactory throughout much of the twentieth century (Lockhart et al. 2021). This particular symbol was used by Anchor Hocking beginning in 1938 and continuing until approximately 1980 (California Department of Transportation 2018). Also embossed on the bottle's base are the numbers 76, 47, and 6. While the "47" and "6" likely represent a mold number and possibly a code for the particular Anchor Hocking plant that made the bottle, the "76" is almost certainly a date code indicating manufacture in 1976. Thus, the deposition of Stratum VIII occurred sometime during or after 1976.

Figure 3-8. Bottle recovered from Trench 1, with close-up of marks on base. Scale in centimeters.

3.1.3.2 Trench 2

Trench 2 was excavated near the center of the project area, north of the gazebo and adjacent to the area of the most severe ponding of surface water (Figure 3-1). In this area, the grade of the path is elevated only slightly above the ponded area to the east. The "ditch fill" which was referred to as Stratum VIII in Trench 1 was encountered just below the modern strata comprising the path surface and underlying topsoil, and the landscaping timbers that line the footpath were identified (Figure 3-9). Excavation of Trench 2 was terminated within the ditch fill when the water table was encountered, and the depth of that fill could not be determined. However, the ditch fill was observed to extend to the western boundary of the trench. Thus, the original ditch, which is not expected to contain burials, is assumed to have extended somewhat to the west of the proposed LOD.

A total of 22 artifacts was recovered from Trench 2, all from the upper two fill strata. The assemblage comprised a single sherd of blue shell-edge pearlware from the uppermost stratum and 18 pieces of clear bottle glass, two fragments of amber glass, and a wire nail from Stratum II. With the exception of the single sherd of pearlware, all of these objects date to the twentieth century and all were recovered from redeposited contexts.

Figure 3-9. Trench 2, post-excavation. Facing southeast.

3.1.3.3 Trench 3

Trench 3 was located in the northern portion of the project area, north of Trench 2 and just south of the artificial berm that separates the cemetery from the drainage swale to the north (Figure 3-1). The stratigraphy of Trench 3 was similar to that which was observed in Trench 2, and the landscaping timbers that line the footpath were present (Figure 3-10). As in Trench 2, the ditch fill was encountered across most of the trench floor, and the water table was encountered before the underlying strata could be reached. However, a buried ground surface was encountered beneath the ditch fill in the far western portion of the unit, although only a small amount of this strata could be exposed due to the presence of a large piece of asphalt (Figure 3-11). It was possible to extrapolate the edge of the original ditch by connecting the edges of the ditch fill as encountered in Trenches 1 and 3 (Figure 3-1). Although the actual edge of the ditch fill certainly varies somewhat from the straight line obtained through this extrapolation, it is assumed that the extrapolated line approximates the western limits of the original ditch.

No artifacts were recovered from Trench 3.

3.1.3.4 Trench 4

Trench 4 was located in the northern portion of the project area, northeast of Trench 3 (Figure 3-1). This trench was oriented north-south and spanned the berm that separates the cemetery from the drainage swale to the north. The stratigraphy of this trench comprised three fill deposits overlying subsoil (Figure 3-12). The absence of a buried A horizon in this location evidence grading of the area prior to the construction of the berm. No grave-related or other features were present in Trench 4, and no artifacts were recovered.

Figure 3-10. Trench 3, post-excavation. Facing southwest.

3.1.4 Test Units

Following the excavation of Trenches 1 through 3, it was determined that the proposed test unit locations fell primarily within the area that contained the ditch fill and disturbance associated with the installation of the existing pipe. As a result, only two of the 10 originally proposed test units were excavated. These were designated TU 3 and TU 4, following the originally proposed naming scheme for units in these locations. The nature of the anomalies that were not investigated is indeterminate, although their locations within the area determined to be an infilled natural drainage seemingly precludes their interpretation as burials and indicates that they post-date the installation of the existing drainpipe circa-1976. It may also be the case that the geophysical survey mapping was not georeferenced with sufficient precision to facilitate accurate relocation of anomalies and that the anomalies lie partially outside the area of archaeological investigation.

Figure 3-11. West end of Trench 3. Buried surface visible as dark soil in upper right of frame.

Figure 3-12. Trench 4, post-excavation. Facing southwest.

3.1.5 Test Unit 3

TU 3 was located west of the path that runs north-south through the cemetery and just southwest of the gazebo that lies within the path (Figure 3-1). The test unit was placed near a GPR anomaly interpreted as a probable grave and just east of a headstone associated with the surname "Stewart" (Figure 3-13). The base of this headstone was somewhat skewed from the orientation of most of the other stones in the cemetery and it appears to have been moved to some degree. Thus, the precise location of TU 3 was chosen to ground-truth the GPR anomaly and to investigate whether there was indeed a burial associated with this headstone, as well as to determine how far the associated grave might extend toward the footpath.

The upper two strata in TU 3 comprised redeposited soils that may represent attempts at grading to redirect surface water or overburden resulting from the installation of the existing drainpipe. The base of a footstone was located at the interface of Stratum II with Stratum III, a former ground surface. Although the top portion was broken off, the base of the footstone remained set in the ground. West of the footstone, a redeposited soil feature representing a backfilled grave shaft was identified. Excavation ceased upon encountering the grave shaft. The only artifact identified in TU 3 was the base of a refined white earthenware saucer found in the top of Stratum III in the northeastern corner of the test unit. It was left *in situ*. No artifacts were recovered from TU 3.

Figure 3-13. TU 3, facing west and showing footstone, grave shaft, and associated headstone.

3.1.5.1 Test Unit 4

TU 4 was located south of the gazebo and within the path (Figure 3-1). It was placed in the vicinity of a GPR anomaly interpreted as a probable grave, but smaller than a typical adult burial. The stratigraphy of TU 4 consisted of footpath fill overlying the ditch fill, as seen in Trenches 2 and 3. A portion of a landscaping timber lining the west side of the footpath was identified (Figure 3-14). Excavation ceased upon encountering the ditch fill, as it was assumed that no graves would be present within the former ditch.

Figure 3-14. North profile of TU 4. Note landscaping timber to left of frame.

4.0 SUMMARY AND RECOMMENDATIONS

Jacobs has been selected by the City of Alexandria to design and implement a solution to persistent drainage issues that cause standing water in the Douglass Memorial Cemetery following heavy rainfall events. The City has obtained control over the property containing the Cemetery in the interest of preserving it as a historic resource. Gray & Pape was retained by Jacobs to conduct archaeological investigations within the project's proposed LOD to delineate areas in which ground-disturbing activities will not be expected to result in impacts to burials. Archaeological investigations included the excavation of four trenches and two test units, detailed mapping of the excavations and nearby landscape features, artifact analysis, and artifact and document curation.

Gray & Pape's investigations defined the approximate proposed limits of disturbance resulting from the installation of the existing drainage system and located what is believed to be an approximate boundary for the line of burials immediately west of the proposed LOD. In addition, the chronology for the installation of the current drainpipe was determined to be 1976 or later, after the last known burial in the cemetery. As a result, Gray & Pape, in consultation with Alexandria Archaeology, was able to provide data to Jacobs allowing for the establishment of a corridor within which ground-disturbing activities associated with the currently proposed project could likely be carried out without impacts to adjacent burials (Figure 4-1). However, because these boundaries were based in part on extrapolation rather than direct observation, it is recommended that ground-disturbing activities associated with the installation of the new drainage system be monitored by a qualified archaeologist.

Figure 4-1
Revised construction plans.

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- Footstone
- Landscaping Timber
- Extrapolated Ditch Boundary
- Headstone
- Grave Shaft
- Test Unit
- Trench
- Existing Pipe
- Existing Pipe Trench
- Existing Ditch
- Existing Drain Gate
- Revised Limit of Disturbance
- Project Area

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