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Visual Impact Assessment

Pentagon Memorial Fund Visitor Education Center



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Introduction

The Pentagon Memorial Fund (PMF) is proposing to construct a Visitor Education Center (VEC) on land owned by Arlington National Cemetery (ANC). The proposed site falls entirely within the Southern Expansion site that was first proposed in 2016 to accommodate the increasing requirements for interment space at the cemetery. The VEC site involves the use of approximately 3.71 acres and is currently bound by the existing Air Force Memorial to the west, Columbia Pike, Joyce Avenue and Interstate 395 on the south (Figure 1).

This document describes the methodology used to develop the Area of Potential Effect (APE), the resources that were identified within the APE, the visibility between the existing resources and the proposed VEC, and the impact of the proposed VEC on the identified historic resources.

The project location is within the area studied for the Southern Expansion of Arlington National Cemetery (ANC) therefore, the *Viewshed Study and Impact Assessment*¹ completed to support that undertaking was used as a reference. Other guidance that contributed to the development of this document includes the ANC *Integrated Cultural Resources Management Plan* (ICRMP) and the Programmatic Agreement (PA) between ANC, Virginia State Historic Preservation Officer (VDHR), and the Advisory Council on Historic Preservation (ACHP) dated 2014. Information for the specific historic resources identified as potentially effected was gathered from Virginia Cultural Resource Inventory System (VCRIS) as well as Washington DC Planning websites.

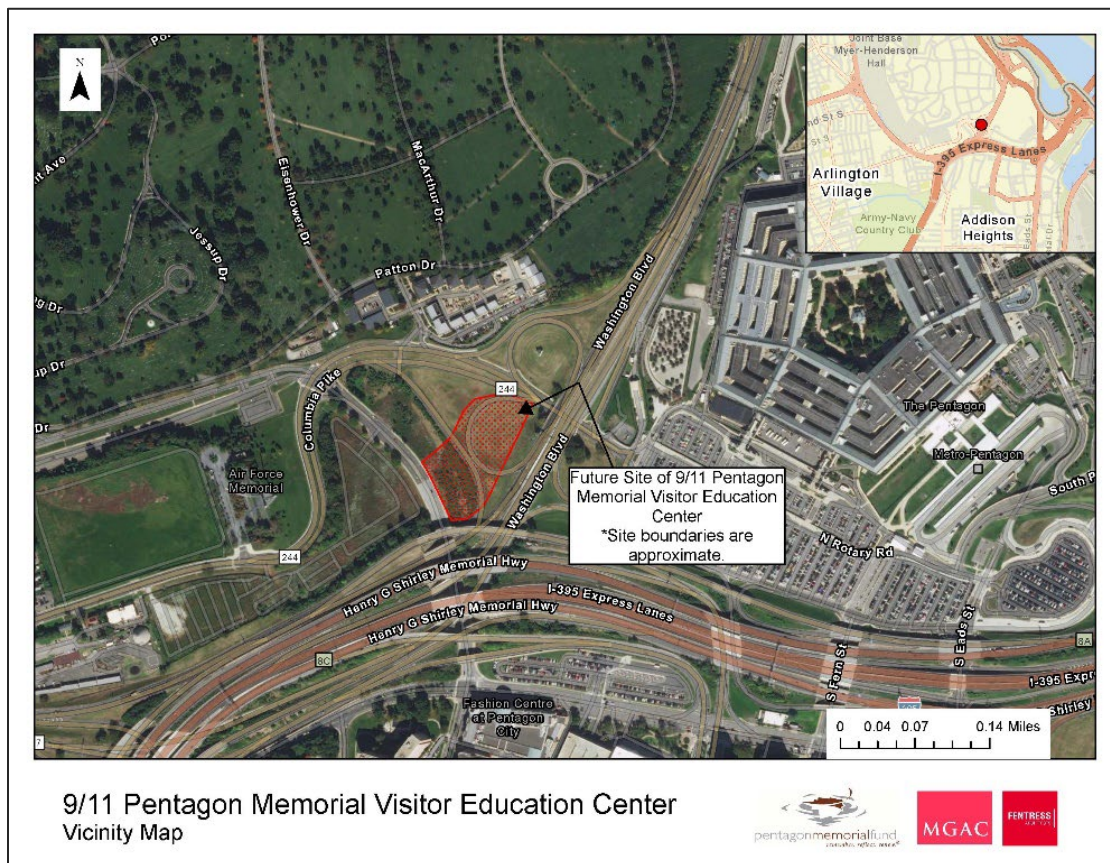


Figure 1: Project location map for the Pentagon Memorial Visitor Education Center

¹ Wanner, "Arlington National Cemetery Southern Expansion Site – Viewshed Study and Impact Assessment."

Study Purpose

The Pentagon Memorial Fund (PMF) is proposing to construct a Visitor Education Center (VEC) on land owned by Arlington National Cemetery (ANC).

In accordance with Section 106 of the National Historic Preservation Act of 1966 (as amended) (NHPA), the potential direct and indirect effects on historic resources must be evaluated.

As defined by 36CFR800.16(d), an APE is: “the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking”. The APE identifies all historic properties within a radius of the project location. This APE not only considers potential direct effects on resources, but also indirect effects such as impacts to viewsheds and vistas.

Additionally, this report identifies all resources within the APE that are listed in or are eligible for listing in the National Register of Historic Places (NRHP) and therefore have the potential to be impacted by the construction of the VEC. JMT completed on-site documentation with digital photography on February 22, 2023, and March 9, 2023. The result of the digital photography provided insight that allowed JMT to assess the potential visual impacts of the proposed VEC on the historic resources.

The information gathered in this report will support the findings of the EA as well as the completion of the Section 106 process, which will fully evaluate potential effects of the proposed undertaking on surrounding resources in accordance with the NHPA of 1966 as amended.

Proposed Action

PMF proposes to construct and operate a VEC that will support visitors of the 9/11 Pentagon Memorial. ANC will provide a license to the PMF to permit use of the land owned by ANC (Figure 1).

The proposed VEC would include exhibits and programs to engage visitors and educate them as to the effects and broad impact of the tragedy from a variety of perspectives. While a memorial exists that honors the 184 lives that were lost as a result of the attack on the Pentagon, there is no Visitor Education Center that provides an understanding of the events of that day, the lives lost, and the historic significance of the 9/11 Pentagon Memorial Site. The proposed VEC would provide details of the 184 individuals who lost their lives on 9/11, interpretive displays discussing the symbolism of the memorial design, permanent restrooms, shelter for visitors, a café, bookstore, and conference space.

The proposed VEC would occupy approximately 3.71 acres adjacent to the Southern Expansion of ANC. After reconfiguration of these roadways resulting from the Federal Highway Administration's Defense Access Roadway project, the VEC would be bounded by Columbia Pike, East Joyce Street, and Washington Boulevard. In accordance with the NHPA, ANC is initiating the Section 106 process to receive concurrence on the Area of Potential Effect (APE) and proposed consulting parties to be included in the process.

The proposed undertaking would include the construction of a new building with an approximate absolute elevation of 95-feet at the highest point at the southeast corner of the building, which includes the rooftop mechanical enclosure. The absolute elevation of the remaining building will be 81-feet to the top of the parapet. At this time, the exact siting of the facility on the parcel has yet to be finalized, however, the building is anticipated to be constructed at the northern end of the site with a building footprint ranging from 25,000 to 30,000 square feet. Up to 100 parking spaces are anticipated and would be located to the south of the building. An entrance on South Joyce Street will serve as the access point for cars, buses, and service vehicles (Figure 2).

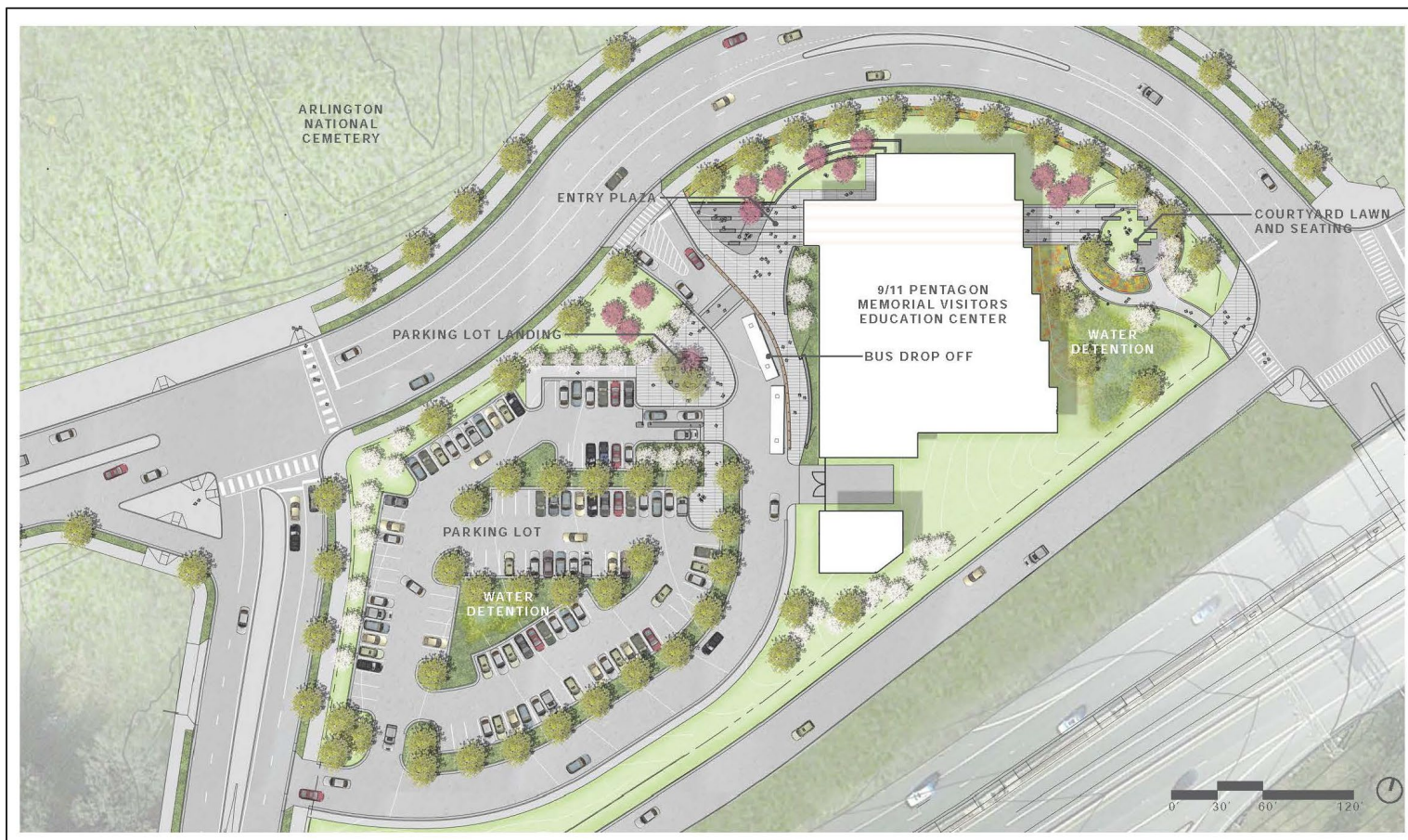


Figure 2: Proposed site plan as of March 2023 (Source: Fentress Architects)

Methodology

The APE was developed using a combination of findings from the 2016 *Viewshed Study and Impact Assessment* completed by EAC/A, Inc., ArcGIS (to create an initial Digital Elevation Model (DEM)), Google Earth Pro to evaluate line-of-sight to and from the project location, and on-site survey. The APE was established to encompass all areas with the potential to be directly or indirectly affected by the proposed undertaking.

DIGITAL ELEVATION MODEL (DEM)

The DEM is a projection that gathers information about the topographic surroundings of the project location. DEMs can be derived from topographic maps as well as high resolution Light Detection and Ranging (LiDAR) data. JMT developed the DEM using 2-foot contour data as the LiDAR data for Arlington County was not publicly accessible. The gathered contour data was transformed with ArcGIS Pro using the spatial analyst tool. With the DEM developed, JMT then utilized the ArcGIS Pro Viewshed spatial analyst tool after a focal point, generally in the center of the proposed VEC site, was identified and included the proposed 95-feet and 81-feet top heights of the building.

According to the United States Geological Survey (USGS) website, a DEM “represents the bare ground topographic surface of the earth excluding trees, buildings, and any other surface objects.” These omissions therefore result in the capture of a larger viewshed than what would be visible in reality. The result of this DEM projected visibility of the proposed site reaching as far as approximately three miles (Figure 3). Similarly, the DEM for the Southern Expansion returned a viewshed which included resources as far away as four miles.

Given this information and the findings of both the VEC and Southern Expansion DEMs, it was determined that further evaluation and refinement was required to determine the distance from which the VEC will be seen from nearby resources and vice versa.

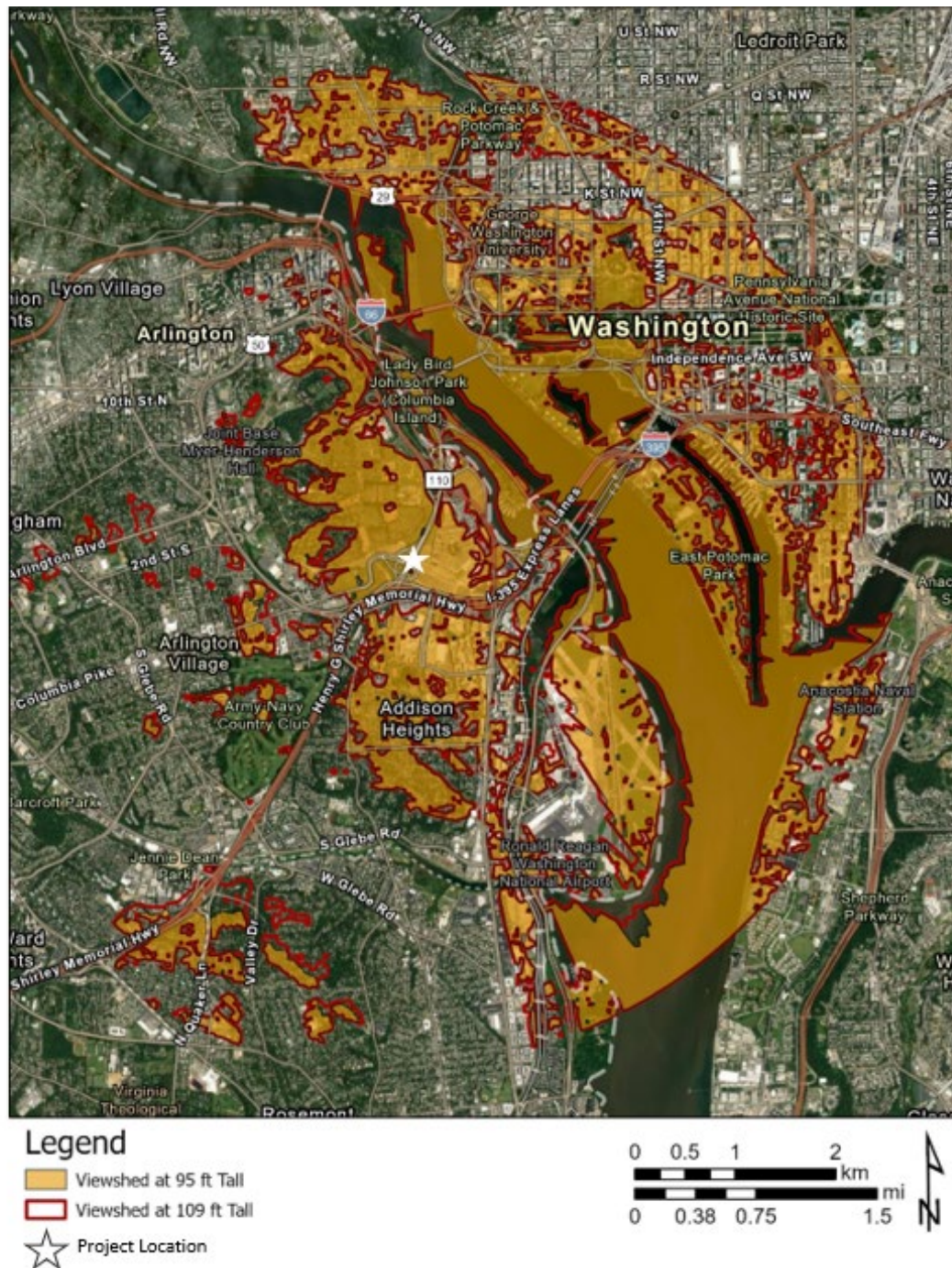


Figure 3: Digital Elevation Model (DEM) showing potential visibility from proposed VEC location.

LINE-OF-SIGHT ASSESSMENTS

To further refine the viewshed and therefore the APE, line-of-sight assessments were developed using vantage points identified through the DEM. The Southern Expansion *Viewshed Study and Impact Assessment* similarly addressed DEM inaccuracies with line-of-sight projections. Given that the proposed VEC site falls within the high point of the area assessed for the Southern Expansion, it is likely the line-of-sight projections would be similar.

When the omitted flora and built environment were considered in concert with the DEMs, lines-of-sight would frequently be impacted, ultimately decreasing the distance from which potential effects needed to be considered. The dense development of buildings and infrastructure throughout downtown Washington and surrounding neighborhoods, and Arlington, Virginia, blocks visibility of the proposed VEC site. The areas to the north, west, and south of Arlington National Cemetery are characterized by an extensive infrastructure system including raised roadways and dense building development of varying heights. Additionally, the mature landscaping that characterizes the cemetery further obscures lines-of-sight to and from the VEC site and historic resources.

The most significant factor that will affect the lines-of-sight to and from the VEC is the relatively low elevation of the proposed building. The preferred alternative for the undertaking involves the construction of the VEC at the lowest point within the proposed boundaries of the site. These circumstances will lessen potential visibility and impact of the two-story building from historic resources, thereby minimizing effects.

JMT assessed line-of-sight visibility using the elevation profile tool in Google Earth Pro supported by on-site photography. This tool provides a visual interpretation of the elevation changes between two points. If there is a point between the two locations with a higher elevation, the line-of-sight will be obscured. Figure 4 - Figure 9 are examples of elevation profiles from various locations identified in the DEM projection. Photograph 1 - Photograph 4 supplement the elevation profiles.

While the DEM projected the project would be visible well beyond a mile of the project site, JMT assessed that the line-of-sight between the proposed VEC and various points throughout Washington, DC and Arlington, VA were blocked from view based on the presence of visual obstructions. As a result, it was determined that many historic resources would not have visibility of the VEC site therefore, JMT was able to further shrink the viewshed.

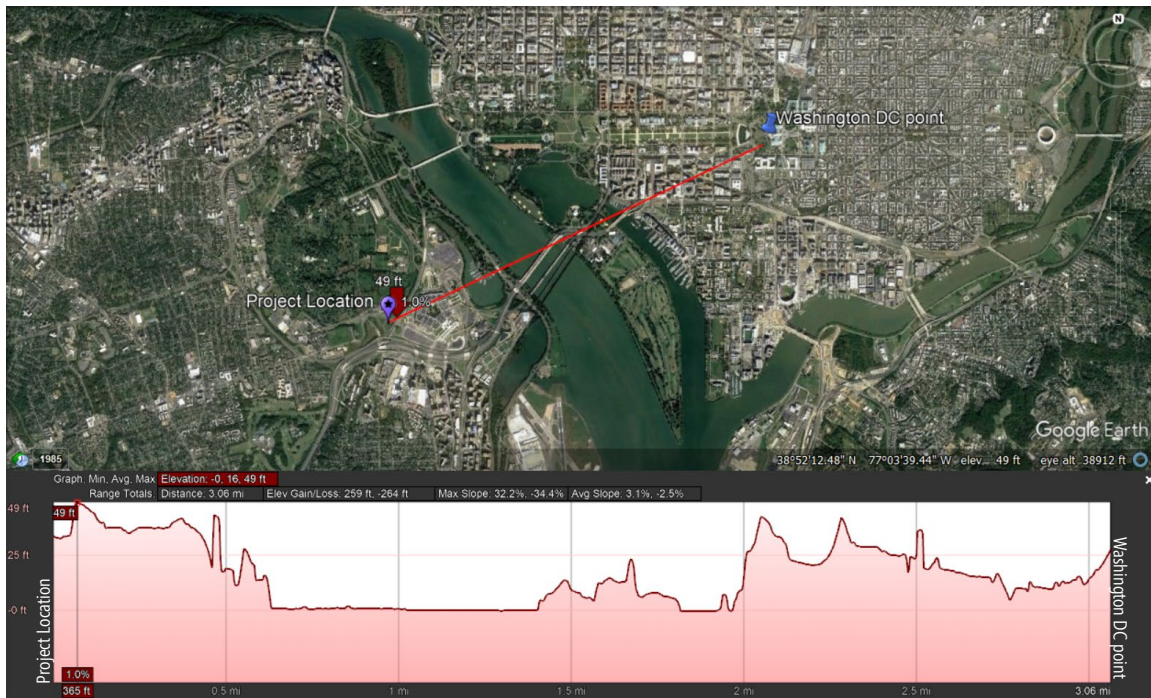


Figure 4: Elevation profile from the proposed site of the VEC to one of the furthest points identified in the DEM near the US Capitol. Note a location approximately 365 feet from the VEC has a higher elevation (49-feet) than the VEC and terminus point, blocking the line-of-sight.

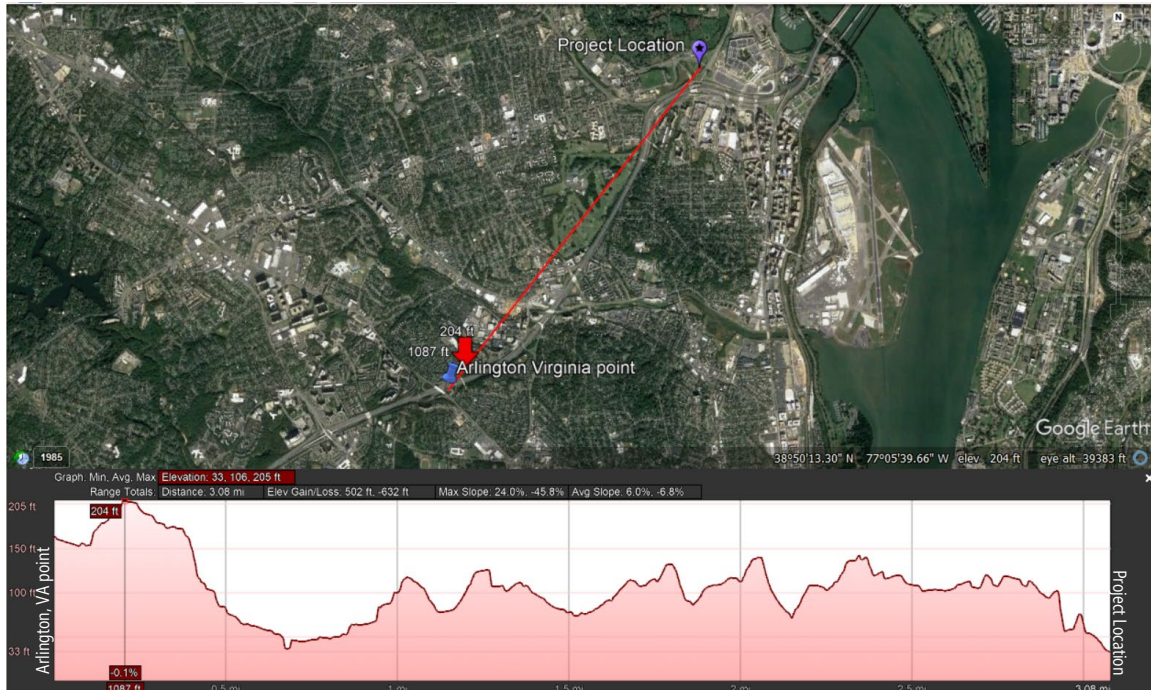


Figure 5: Elevation profile from one of the furthest points identified in the DEM in Arlington, VA near where King Street (Route 7) passes over 395, to the proposed VEC site. Note a location approximately 0.2-mile from the Arlington point has a higher elevation (204-feet) than the starting point and VEC, blocking the line-of-sight.

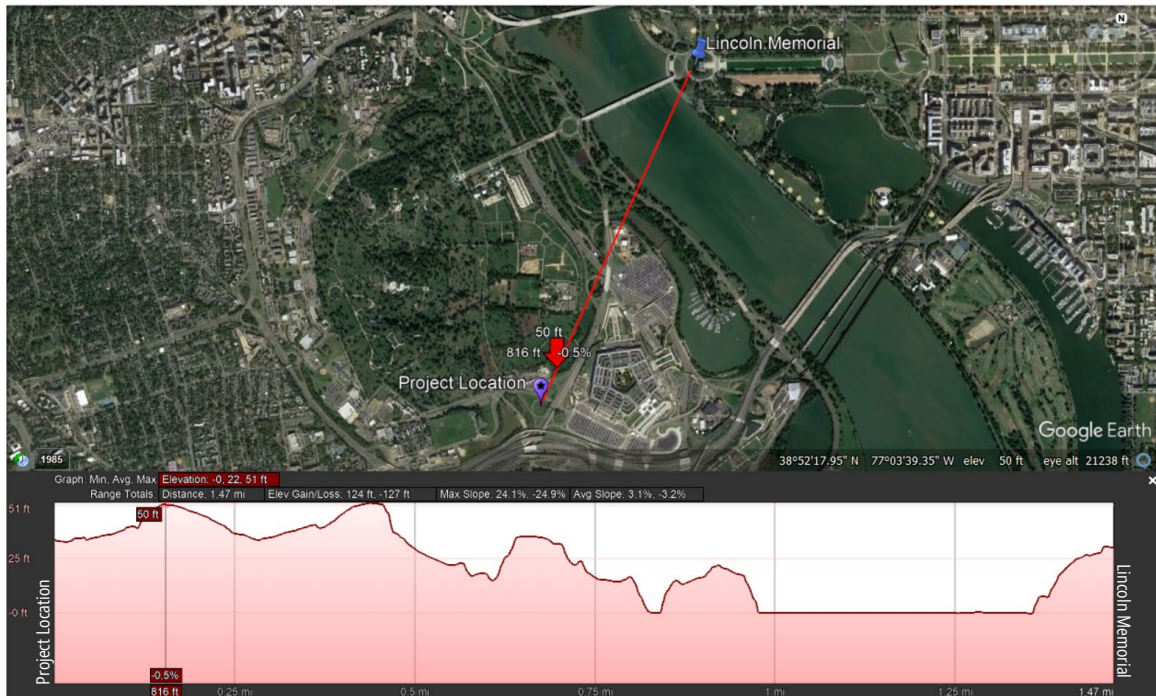
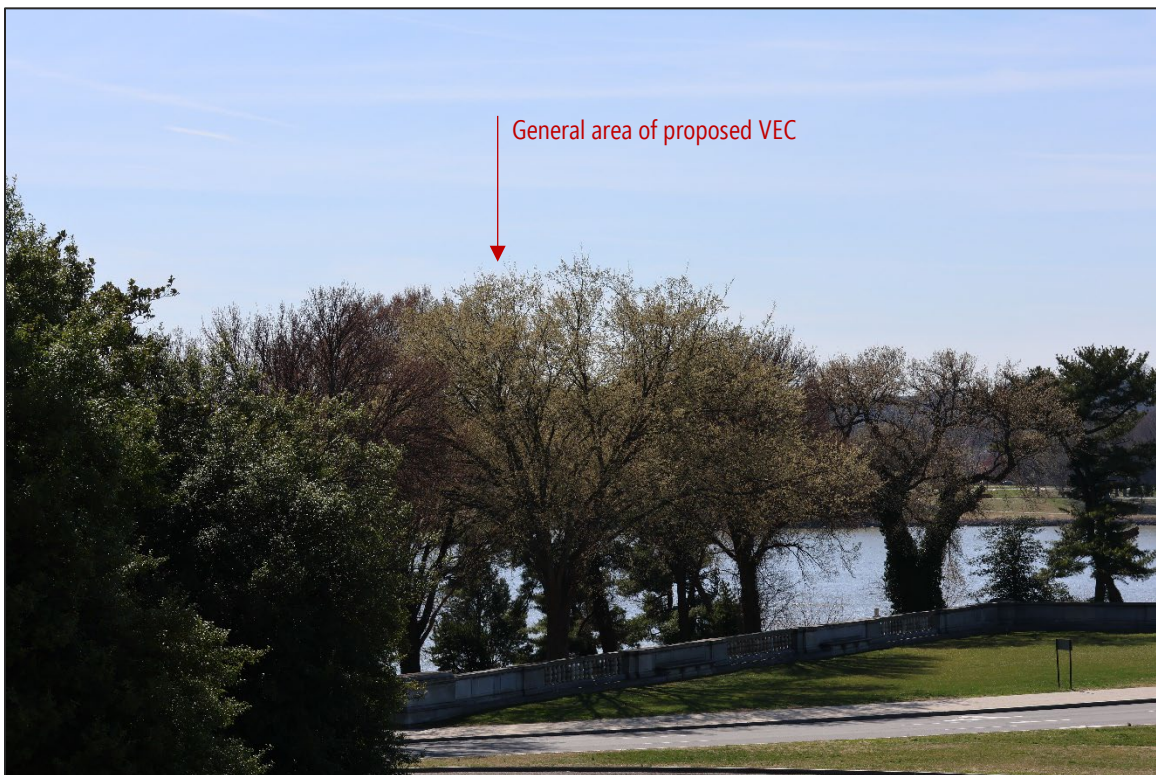


Figure 6: Elevation profile from the proposed site of the VEC to the Lincoln Memorial. The line-of-sight is interrupted approximately 816-feet from the proposed VEC site by a point with a 50-foot elevation.



Photograph 1: View from the rear of the Lincoln Memorial towards proposed VEC location; looking south-southwest.

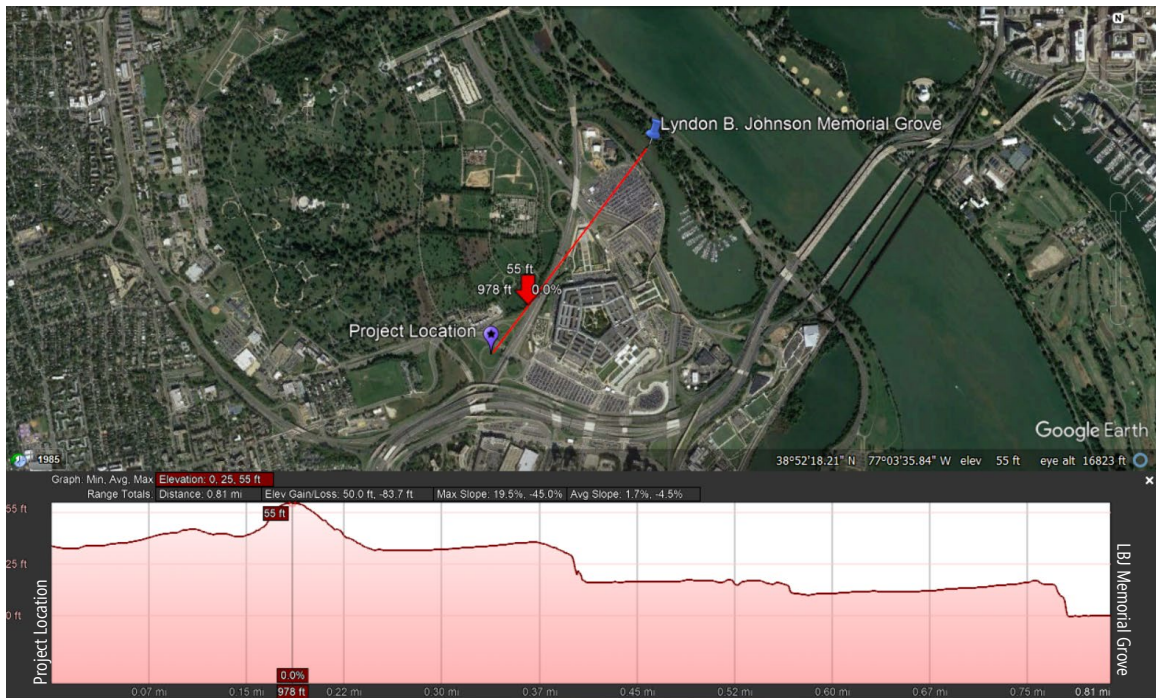


Figure 7: Elevation profile from the proposed site of the VEC to the Lyndon B. Johnson (LBJ) Memorial Grove. The line of site is interrupted approximately 978-feet from the proposed VEC site by a point with a 55-foot elevation.



Photograph 2: View from the LBJ Memorial Grove towards proposed VEC location; looking southwest.

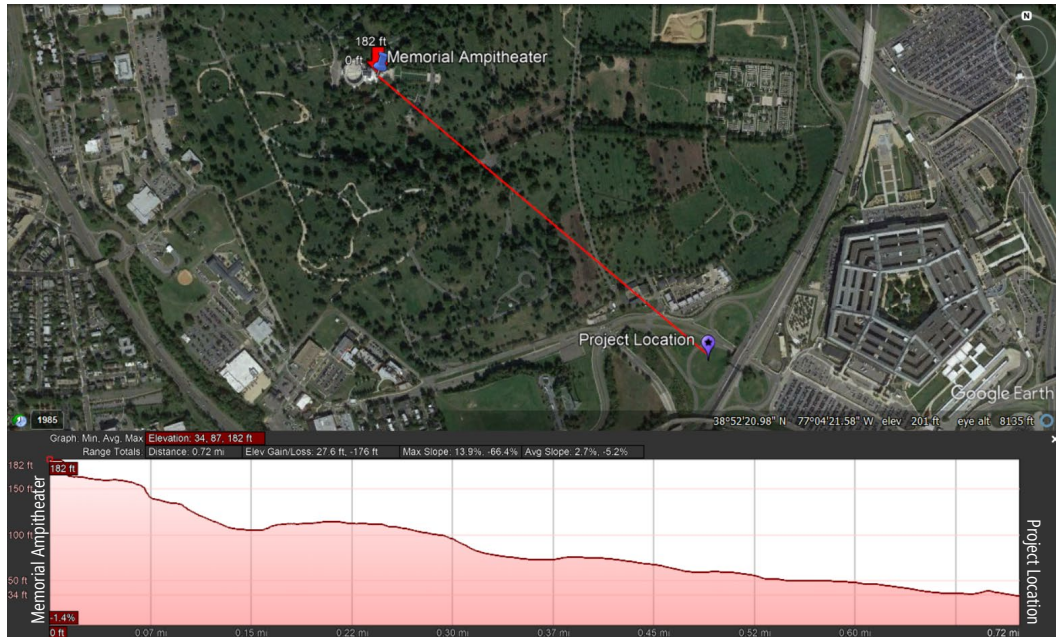
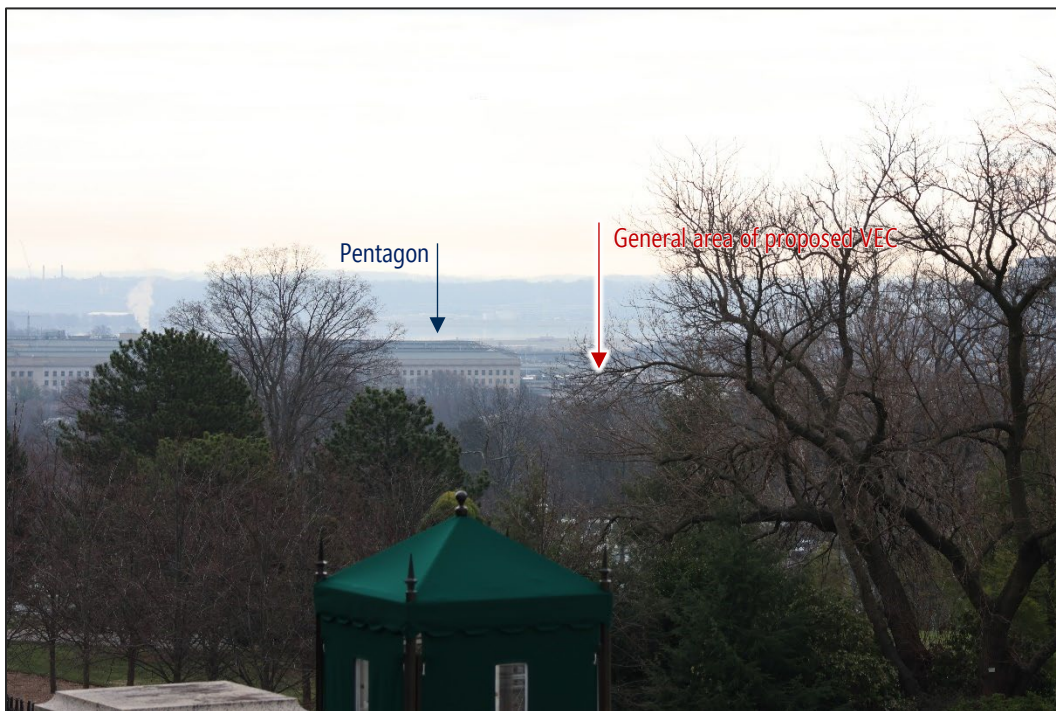


Figure 8: Elevation profile from the Memorial Amphitheater to the VEC. Although the line appears uninterrupted, the line-of-sight is likely interrupted by mature trees and buildings near the proposed VEC site.



Photograph 3: View from the Memorial Amphitheater towards the proposed VEC location; looking southeast.

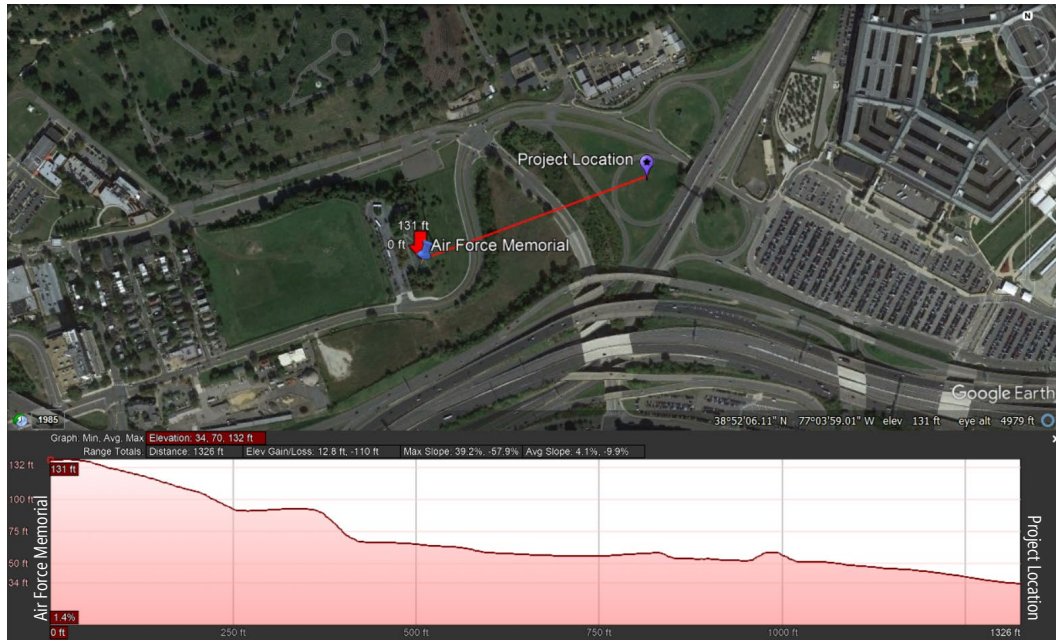


Figure 9: Elevation profile from the Air Force Memorial to the VEC. The line of sight appears interrupted.



Photograph 4: View from the Air Force Memorial towards the proposed VEC location; looking east.

FINAL APE

JMT refined the APE by analyzing the DEM, elevation models, and supporting photography in combination with the proposed scale of the VEC, surrounding built environment, and foliage. As a result, JMT determined that a visual APE of 0.25-mile is sufficient to capture the potential visual effects of the proposed undertaking. This APE includes all areas in which the proposed VEC may introduce visual elements that diminish or alter the setting, including the landscape, of extant historic resources.

Potential temporary impacts to the resources within the APE include haul routes, construction noise, and dust. The effects of these impacts will be mitigated by the presence of Washington Boulevard, Columbia Pike, and the Arlington National Cemetery service complex. Once construction is complete, impacts from maintenance activities and events at the site will be similar in nature to the Air Force Memorial and the Cemetery.

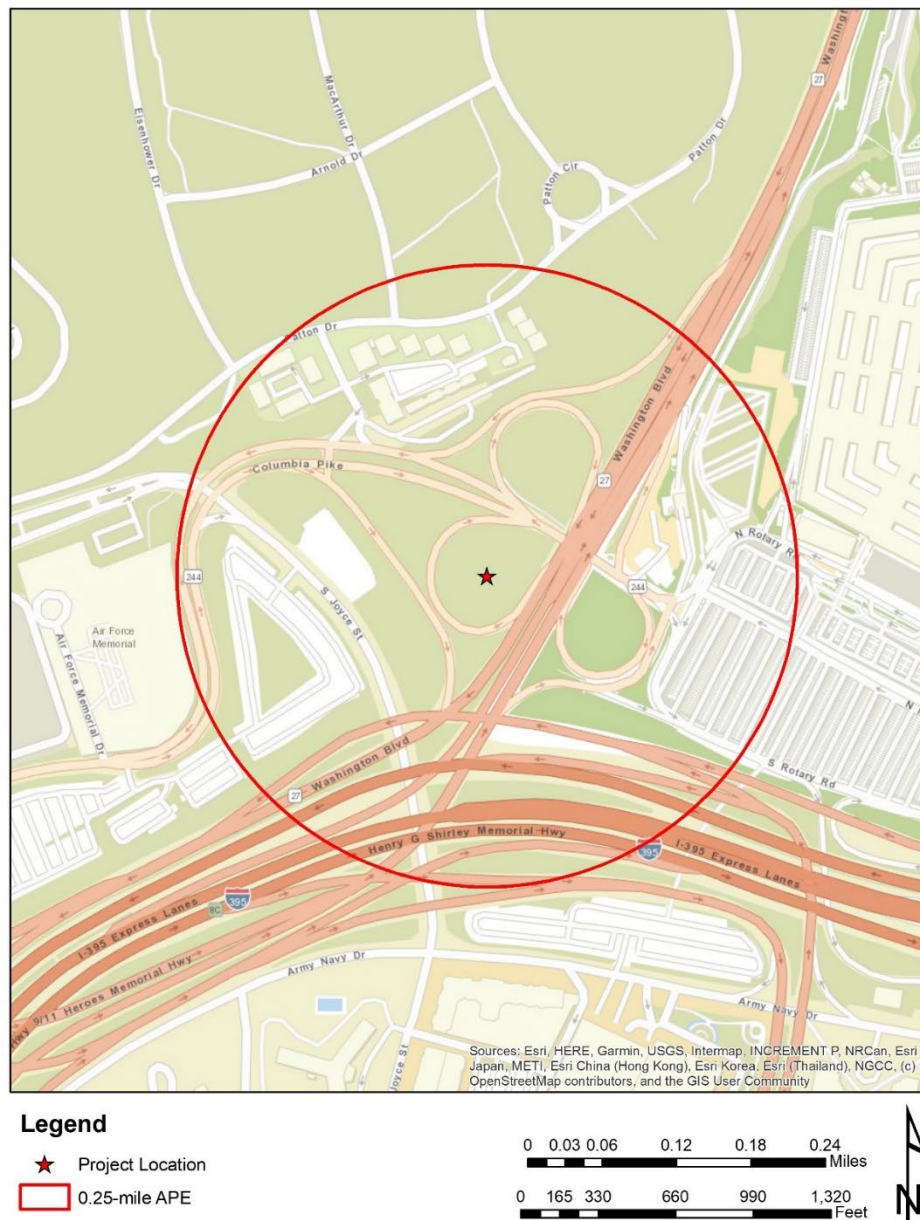


Figure 10: APE map.

Fieldwork Findings

Using VCRIS and the ANC ICRMP, JMT gathered information about historic resources that fall within the final visual APE (Figure 12, Figure 14, and Figure 14). According to VCRIS, there are three previously identified resources eligible for or listed in the National Register of Historic Places within the 0.25-mile APE: the Pentagon Office Building Complex, the Air Force Memorial, and Arlington National Cemetery (Table 1). Additionally, there is one ANC contributing view/vista, per ANC ICRMP, with the potential to be affected by the VEC, the view towards Air Force Memorial (Table 2). No resources that contribute to Arlington National Cemetery are located within the APE².

The following pages demonstrate the view to and from the proposed VEC site to the extant historic resources within the APE.

Table 1: Previously identified historic resources within the visual APE according to VCRIS.

RESOURCE ID NUMBERS	RESOURCE NAME	ELIGIBILITY	PHOTOGRAPHS
000-0072	Pentagon Office Building Complex	Listed	5-6
000-9821	Air Force Memorial	Potentially Eligible	7-8
000-0042	Arlington National Cemetery	Listed	3, 9-10

² Three non-contributing resources are within the APE however were not evaluated for this report.

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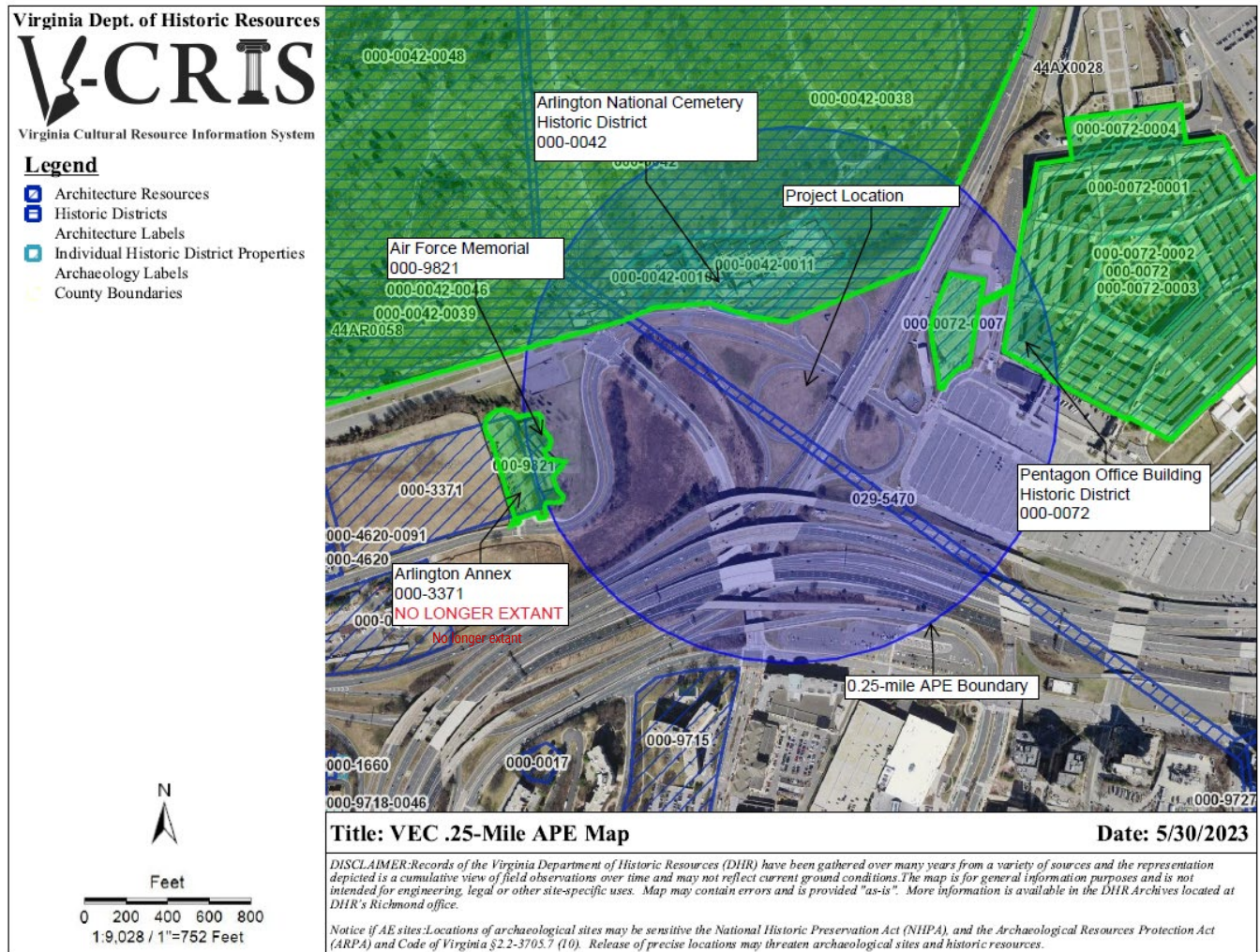


Figure 11: Previously identified resource map from VCRIS.

PENTAGON OFFICE BUILDING COMPLEX (Listed Resource)



Photograph 5: View from proposed VEC site towards Pentagon Office Building Complex (000-0072); looking east.



Photograph 6: View from the Pentagon Office Building Complex towards the proposed VEC site looking west.

DETERMINATION

The current view from the Pentagon Office Building Complex towards the proposed VEC site includes a combination of infrastructure including Washington and South Washington Boulevards and aboveground utilities, the Sheraton Pentagon City, and the Air Force Memorial resulting in a cluttered viewshed. While the proposed building will augment the built features within the viewshed, the lower ground elevation of the site relative to the Pentagon combined with the interference of Washington Boulevard prevents a direct view between the sites. The construction of the VEC will have no adverse effect on the Pentagon Office Building Complex.

AIR FORCE MEMORIAL (Potentially Eligible Resource)



Photograph 7: View from proposed VEC site towards the Air Force Memorial (000-9821) (000-3371); looking west.



Photograph 8: View from the Air Force Memorial towards the proposed VEC; looking east.

DETERMINATION

While the proposed VEC will be visible from the Air Force Memorial, it will have a lower absolute elevation than the memorial and other buildings in the viewshed including the Pentagon and the Altaire apartment complex to the east. The comparatively low height of the proposed VEC will serve to minimize its effect on the viewshed. Furthermore, the sensitive design of the VEC will blend with the surrounding landscape to further diminish its consequence on the landscape. The construction of the VEC will have no adverse effect on the Air Force Memorial.

ARLINGTON NATIONAL CEMETERY (Listed)



Photograph 9: View from VEC site towards Arlington National Cemetery; looking northwest.



Photograph 10: View from Arlington National Cemetery toward the VEC site; looking southwest.

DETERMINATION

The views towards the proposed VEC from the closest boundaries of ANC will be disrupted by the cemetery's service complex and the treeline adjacent to South Washington Boulevard to the east of the service complex. Similarly, west of the service complex the line-of-sight will be broken by mature foliage, Southgate Road, and Columbia Pike. Additionally, the low absolute elevation of the proposed VEC will further diminish its visibility from the cemetery. The construction of the VEC will have no adverse effect on ANC.

Table 2: ANC contributing view, per ANC ICRMP, with the potential to be affected by the VEC.

RESOURCE	STATUS	PHOTOGRAPHS
View towards Air Force Memorial (View 1)	Contributing, Criterion A for military association	9-10

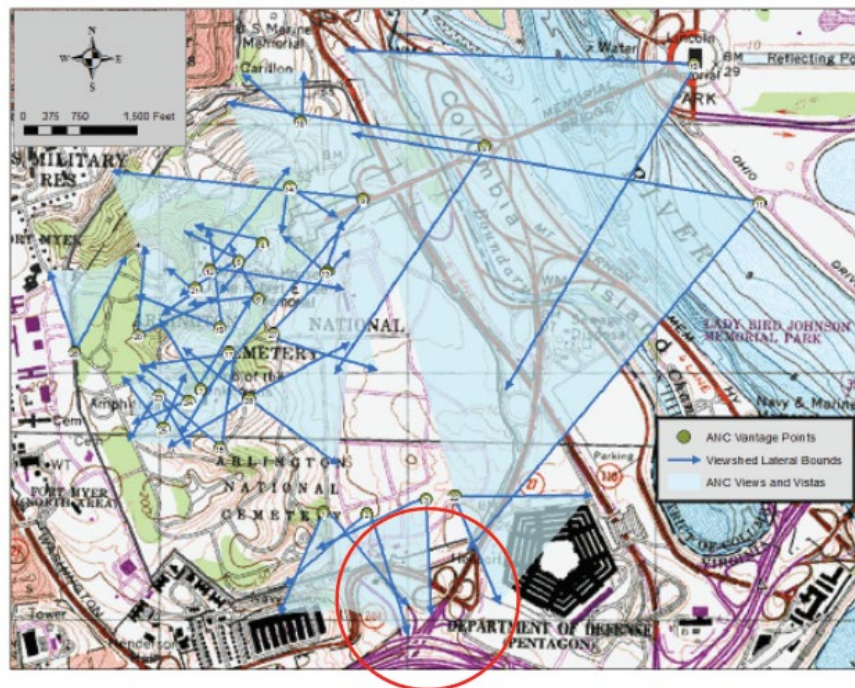


Figure 12: 0.25-mile APE identified by red circle on ICRMP map of ANC views and vistas.

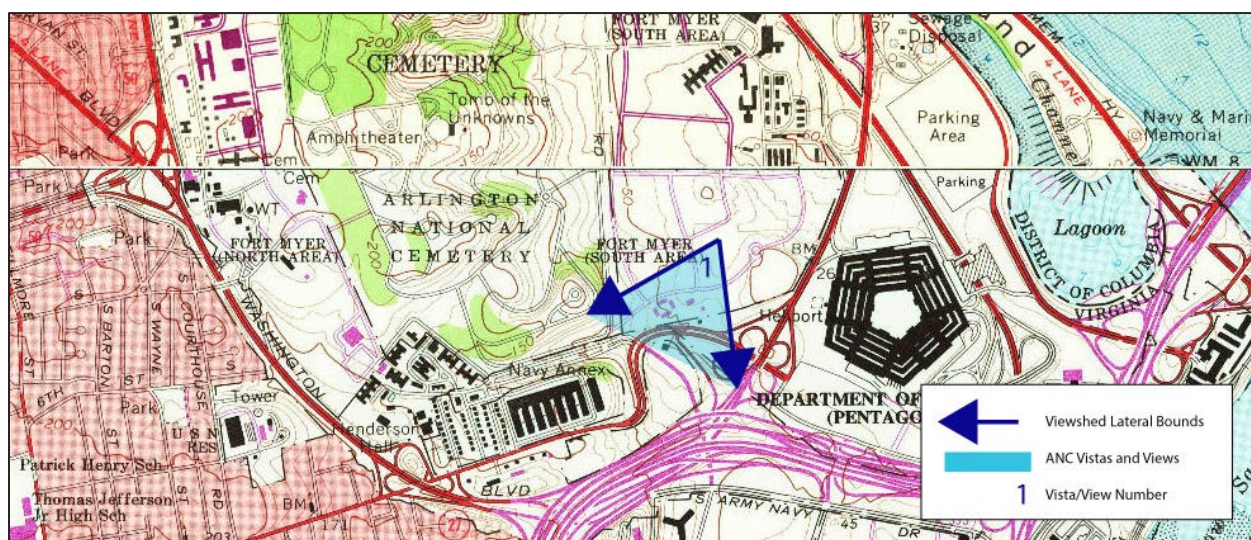
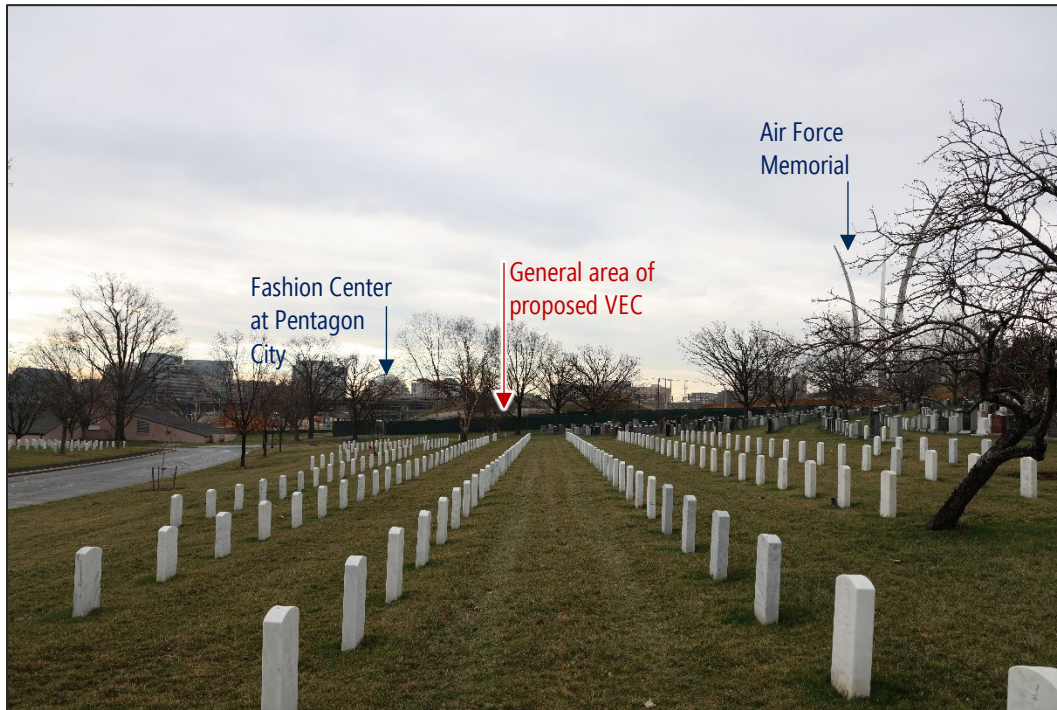


Figure 13: Arlington Nation Cemetery contributing view with the potential to be affected by the proposed VEC (Source: ANC ICRMP).

VIEW TOWARDS AIR FORCE MEMORIAL (Contributing)



Photograph 11: View towards Air Force Memorial, looking southwest.



Photograph 12: View towards Air Force Memorial, looking southwest.

DETERMINATION

The view towards the Air Force Memorial from Section 68 is identified in the ANC ICRMP as a contributing view to the Arlington National Cemetery Historic District. It is the only contributing view that includes the proposed VEC site. The view was evaluated to determine if the proposed building would affect its integrity as a contributing resource. Mature trees and the service complex completely block the line-of-sight therefore the construction of the VEC will have no effect on the view towards the Air Force Memorial.

Conclusions

This viewshed study was prepared in order to assess potential effects of the proposed construction of the on the property of the Arlington National Cemetery (ANC). The VEC is meant to provide exhibit space and support of visitors of the 9/11 Pentagon Memorial.

In order to develop an accurate APE, effects were first considered through the creation of a Digital Elevation Model (DEM), fine-tuned using line-of-sight assessments, and finalized with on-site photography. With a 0.25-mile APE, Virginia Cultural Resource Inventory System (VCRIS) and the ANC Integrated Cultural Resources Management Plan (ICRMP) were consulted to determine what previously identified resources were located within the APE. Four resources were identified: the Pentagon Office Building Complex (000-0072, Listed Resource), Air Force Memorial (000-9821, Potentially Eligible Resource), Arlington National Cemetery (000-0042, Listed Resource), and the View towards Air Force Memorial (Contributing Resource to ANC). No resources that contribute to Arlington National Cemetery are located within the APE.

Site visits took place on February 22, 2023, and March 9, 2023, so any vegetation was at its thinnest, providing the most potential for visibility between the The goal of the visits was to determine the potential impacts of the proposed VEC on historic resources within the 0.25-mile visual APE. The area surrounding the project location is characterized by a variety of development, both modern and historic, with a complex infrastructure system. All of the photographs were taken during the day, consequently this analysis did not take into account potential light pollution brought on by the proposed VEC building and parking lot.

Topography, infrastructure, buildings, and foliage serve to minimize or block views in many instances also justifying the 0.25-mile APE. After evaluating the views between the resources and the proposed VEC site, it was determined that the VEC will have no adverse effect to extant historic resources.

Bibliography

National Historic Preservation Act of 1966, Pub. L. No. 89–665, § 300101, 54 U.S.C.: National Park Service and Related Programs (1966).

Wanner, Robert. "Arlington National Cemetery Southern Expansion Site – Viewshed Study and Impact Assessment." Baltimore, Maryland: EAC/A, Inc., November 14, 2016.

Appendix A

The Arlington House, The Robert E. Lee Memorial Line of Sight Assessment

The Arlington House, The Robert E. Lee Memorial is an individually listed resource within the Arlington National Cemetery Historic District. Among its significant features, the viewshed from the house looking towards the Washington, DC skyline is particularly important. JMT completed onsite documentation and a line-of-sight assessment using Google Earth to assess any potential impacts the proposed VEC could have on this important viewshed, as well as to assess the proposed VEC's overall potential visibility from the Arlington House.

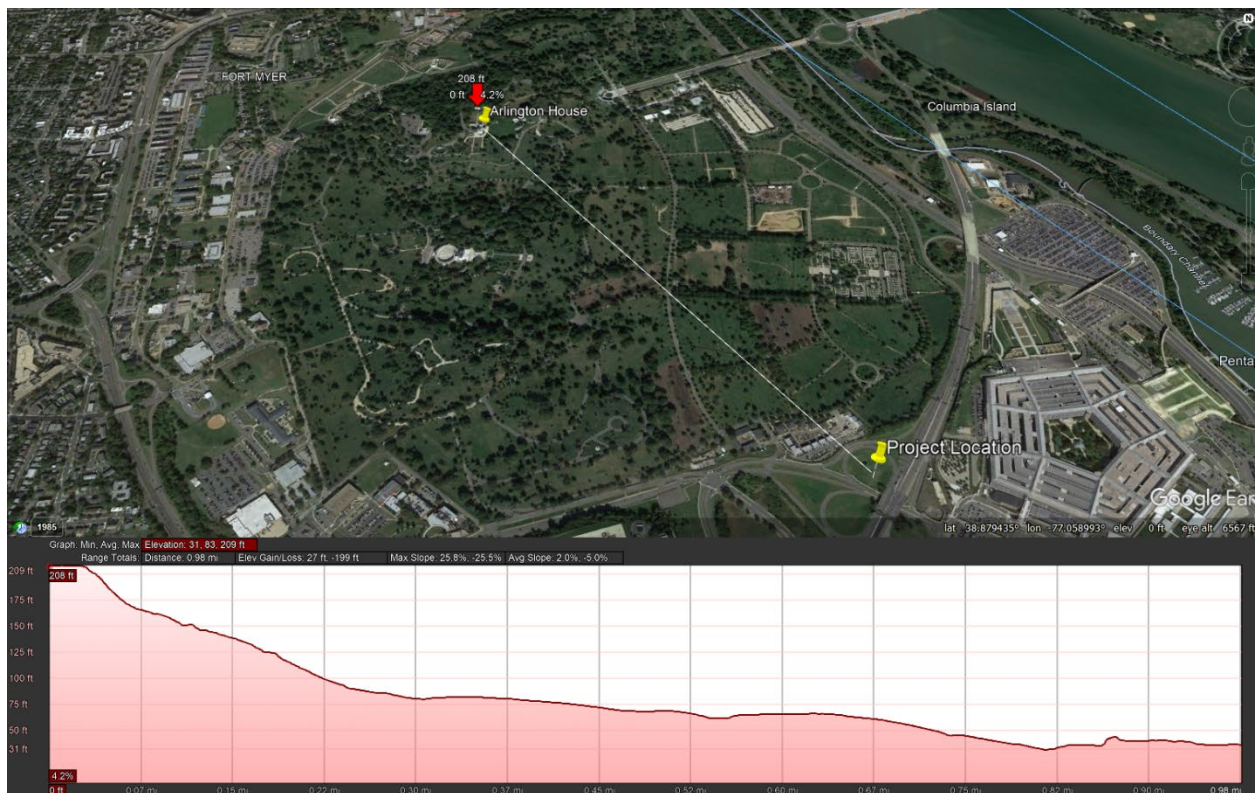


Figure 1: Elevation profile between the Arlington House and proposed VEC site.

The lack of apparent obstruction between the two points indicates the potential for visibility of the VEC from The Arlington House. However, the proposed VEC is not within Arlington House's significant viewshed towards Washington, D.C. The photographic documentation confirms the lack of impact from the proposed VEC on the character defining viewshed and indicates that visibility from the Arlington House towards the proposed VEC will be highly obstructed by

mature vegetation. Additionally, the siting of the proposed VEC will be located at the lowest point of the project site, further mitigating any potential visual impacts on the surrounding area.



Figure 2: Photo location map for Arlington House viewshed towards Washington D.C. (Photos 1-4) and view towards proposed VEC site (Photos 5-6)



Photo 1: View looking northeast towards Washington, DC from the Arlington House, The Robert E. Lee Memorial.



Photo 2: View looking east towards Washington, DC from the Arlington House, The Robert E. Lee Memorial.



Photo 3: View looking southeast towards Washington, DC from the Arlington House, The Robert E. Lee Memorial.



Photo 4: View looking east towards Washington, DC from the Arlington House, The Robert E. Lee Memorial.



Photo 5: View looking south-southeast towards the proposed VEC site from the Arlington House, The Robert E. Lee Memorial. This is not an identified significant viewshed.



Photo 6: View looking south-southeast towards proposed VEC site from the Arlington House, The Robert E. Lee Memorial. This is not an identified significant viewshed.