

MFA BUS MAINTENANCE FACILITY PROJECT
SECTION 106 TECHNICAL REPORT

NASA AMES RESEARCH CENTER
MOFFETT FIELD, CALIFORNIA
[16016]

PREPARED FOR:
NASA AMES RESEARCH CENTER HISTORIC PRESERVATION OFFICE

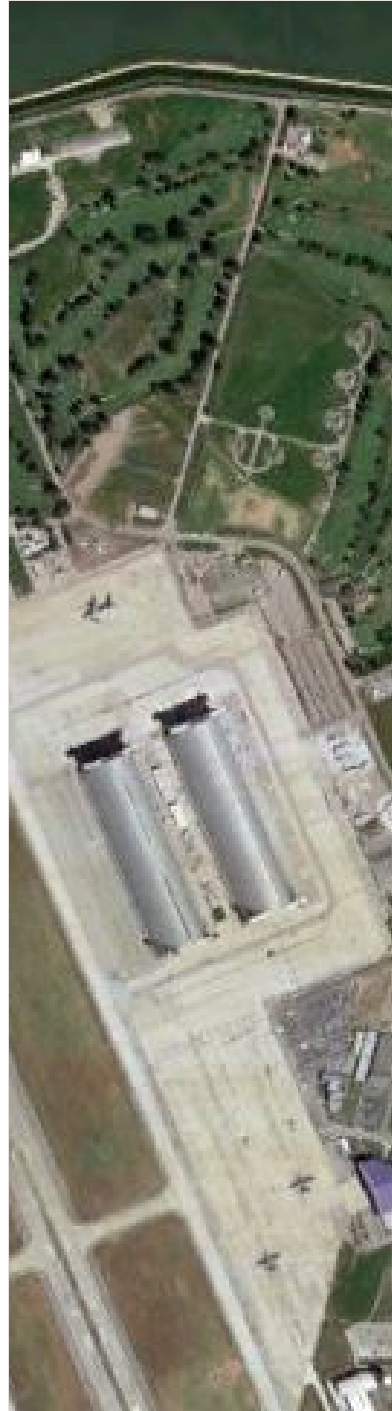


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I. INTRODUCTION

The United States, through the National Aeronautics and Space Administration (NASA), possesses the fee simple interest in the Moffett Federal Airfield (MFA) and NASA Ames Research Center (NASA ARC). As the lead federal agency, NASA is responsible for compliance with the National Historic Preservation Act of 1966, as amended through 2006, including Section 106, 36 CFR Section 800, which requires federal agencies to take into account the effects of their activities and programs on historic properties.

NASA has entered into an Adaptive Reuse Lease regarding the NASA Ames Research Center Eastside/Airfield area at MFA with Planetary Ventures (PV). PV proposes to construct a semi-permanent Bus Maintenance Facility at MFA. The facility will be located east of Hangar 3 on a site that is currently occupied by a concrete parking apron that was originally used for aircraft but is currently being used by buses and automobiles.

Nomenclature

For clarity, the proposed Bus Maintenance Facility project will be referred to as “the Undertaking.”

Within this report, “NASA ARC” will refer to the full extent of the installation operated by NASA. “NASA Ames campus” will refer to the sub-area of NASA ARC, located within the installation’s northwest quadrant that houses the agency’s research facilities. MFA will refer to the airfield and its supporting area composing the eastern half of the property. (See Appendix A for relevant Undertaking maps.)

The term, "Aircraft Parking Apron" is assigned an identification number of MF1002; however, that single identification number is associated with two distinct features located at opposite sides of the airfield. Throughout this report, "Aircraft Parking Apron" or "MF1002" will specifically refer to both features collectively. The distinct portions of MF1002 located on either side of the airfield will be prefaced with "east" or "west" when referring to the specific areas.

PURPOSE

The purpose of this document is to provide necessary information for Section 106 consultation and the application of the Criteria of Adverse Effects to the Area of Potential Effects (APE), pursuant to 36 CFR Section 800.5(a).

This document should be reviewed in conjunction with the Undertaking plans and documentation that have been provided as part of this Section 106 consultation submittal. (See Appendices.)

LOCATION OF THE UNDERTAKING

The site of the proposed Undertaking is located at NASA Ames Research Center (NASA ARC) between the municipalities of Mountain View and Sunnyvale, California, on the southwest edge of San Francisco Bay. The site of the Undertaking is approximately 27 miles southeast of San Francisco International Airport, and six miles northwest of San Jose International Airport. The Undertaking involves the construction of four semi-permanent tent structures on a select portion of the concrete surface of the east Aircraft Parking Apron (MF1002), northeast of Hangar 3. The paved areas north and east adjacent from east MF1002, located between Hangar 3 and south of Macon Road, will be used for bus parking and the associated proposed maintenance facilities. The Undertaking will include both above and below grade interventions.

II. CONTEXT

Moffett Federal Airfield

The installation now known as Moffett Federal Airfield was originally established as Naval Air Station (NAS) Sunnyvale, the West Coast base for the U.S. Navy's burgeoning Lighter-Than-Air (LTA) aviation programs of the 1930s. By the time the air station was commissioned in 1933, the U.S. Naval Bureau of Yards and Docks had constructed Hangar 1, a campus of administrative and residential buildings for military personnel that were related to one another through their Spanish Colonial Revival architectural style, and a small airfield consisting of a landing strip and small diagonal runways in the area east of Hangar 1. The original campus had a formal plan and an axial orientation with Hangar 1; a symmetrical horseshoe-shaped roadway with a large central plaza was flanked by a number of the support buildings. A small community of residences for base staff was constructed around a cul-de-sac southwest of the main campus. The site was transferred to the U.S. Army Air Corps in 1935.

The U.S. Navy regained control of the installation during World War II and reintroduced LTA missions at the installation, by this time known as Moffett Field. Wishing to expand, the Navy acquired over 200 acres of land east of the existing airfield. Hangars 2 and 3 were built in this location between 1942 and 1943. Following the end of the war, the airfield transitioned to support training and testing missions associated with Heavier-Than-Air craft, including supersonic jets. During the late 1940s and 1950s, the Navy expanded the airfield runways and taxiways to meet the take-off and landing requirements of these enhanced aircraft. Additional buildings and airfield features—including explosive storage magazines, fueling pits, and a flight operations building—were introduced in support of these missions.

In 1994, Moffett Field was decommissioned from military use through the Base Realignment and Closure process, after which NASA assumed responsibility for the installation and it was integrated with NASA ARC.

III. DESCRIPTION OF THE UNDERTAKING

The Undertaking consists of the installation of four semi-permanent, steel-frame structures to the east of Hangar 3, arranged in two rows of two. The prefabricated tent structures will feature arched roofs. The northern edge of the structures will be placed in line with the north façades of Hangars 2 and 3. They will occupy a site measuring 170' x 206'. The tents will be 65' by 70' in footprint; they will have 16' walls and a height of 34' at the top of the arched roof. Each tent will shelter three buses. It is not anticipated that existing pavement will be removed for the Bus Maintenance Facility, as the tents have no footings, but will be secured to the pavement using wedge anchors or asphalt nails, depending on the surface material. Twelve shipping containers grouped into three collections of four will be used as storage containers and/or temporary offices. These will be placed immediately east of the bus maintenance shelters on the project site and arranged in a linear row. The shipping containers will be approximately 4' wide, 20' long, and 8'-6" tall.

Power will be supplied to the Bus Maintenance Facility by a new pathway that will extend south from Gate M for approximately 200', then north and northwest to connect to the storage containers of the Bus Maintenance Facility. The pathway section extending from Gate M will reuse existing conduits, whereas the remaining 225' alignment will involve new conduits, which will require open trench construction with a width of 18" and a maximum depth of 36". Following the installation, the concrete will be patched in-kind with the surrounding materials. Overhead electrical lines will connect the bus maintenance shelters.

The installation of the Bus Maintenance Facility will also require the relocation of the existing, temporary K-rail fence line that bounds the edge of the bus parking area approximately 40' to the west, as well as new paint striping in the bus parking lot. It is anticipated that the four tent structures and the shipping containers will remain on site for three to 15 years.

IV. AREA OF POTENTIAL EFFECTS (APE)

DEFINING THE APE

An Area of Potential Effects (APE) is a defined geographic boundary in which historic properties may be affected by an undertaking, including direct effects (such as demolition) and indirect effects (such as blocking a visual corridor) that impact the historic character of a property.¹ An undertaking would have an effect on a historic property if the action would result in changes to the character of any of the historic properties within the APE. An APE may include historic properties that are well beyond the limits of the undertaking.

BOUNDARIES

The following analysis for the current Undertaking involves an APE that represents those areas in which the scope of the Undertaking could potentially affect historic properties—if and where they exist—through physical means, or through visual or atmospheric (noise and vibration) changes that could affect a historic property's integrity of setting. For the current Undertaking, the APE is primarily defined by the boundaries of the airfield at MFA, which corresponds to the boundaries of the expanded area of the NAS Sunnyvale Historic District as proposed in the *Historic Property Survey Report* (AECOM, 2013). The size and location of the APE takes into consideration the potential indirect effects that may occur at historic properties, including visual, atmospheric, and audible intrusions.

The east boundary of APE is defined by the NASA ARC property boundary, which leads from the San Francisco Bay to Highway 101, generally following the path of East Patrol Road, Enterprise Way, and Macon Road. The west boundary has an irregular path that leads north from Macon Road near Highway 101 and follows Cody Road past Hangar 1 to its intersection with Bushnell Road, where it turns west to capture several buildings that stand adjacent to the NACA/NASA Taxiway and Apron. The west boundary then follows Zook Road to the north end of the airfield. The north boundary of the APE generally lies north of the airfield and extends to reach the edge of San Francisco Bay slough, and follows the edge of the slough and North Patrol Road to the northeast corner of the NASA ARC property, meeting the east boundary. The eastern and southern boundaries are defined by Macon Road as it extends around the southern end of the airfield.

Vertical boundaries are also important, as part of the Undertaking is located below grade at an approximate depth of 36" where trenching is required along the utility alignment. The APE encompasses the Area of Direct Impact (ADI), meaning the project site and footprint where direct effects to above and below ground historic properties could occur. Therefore, the ADI is limited to the portion of the parking apron that is subject to any work. The ADI also includes the location of any potential staging sites likely to be used during construction. (The location of the ADI is described in greater detail in Section II, Description of the Undertaking.)

A map illustrating the location of the APE is included in Appendix A as Figure A-2, and maps illustrating the ADI are included in Appendix A as Figures A-3.

¹ Seifert, Donna, *Defining Boundaries for National Register Properties Bulletin*, revised 1997: accessed <http://www.nps.gov/NR/publications/bulletins/boundaries/bound1.htm>

IDENTIFICATION OF HISTORIC PROPERTIES WITHIN THE APE

Historic properties, as defined in 36 CFR Section 800.16(l)(1), include any district, site, building, structure, or object that is included in or eligible for listing in the National Register of Historic Places (NRHP).

Archaeological Properties

William Self Associates (WSA) conducted a records search to determine if archaeological resources were previously identified along the proposed utilities alignments where ground disturbance would occur as part of the Undertaking scope. This search determined that there were no previously recorded archaeological sites located within the Undertaking ADI, nor within a quarter-mile of the proposed alignment. Two structures depicted on an 1899 Palo Alto topographic map appear to be immediately adjacent to the proposed utility alignment, although these structures have not been recorded previously, and no additional information on these structures could be found. However, it is noted that excavation of the electrical conduit trench may reveal portions of these structures during the construction period.

As further described in WSA's Archaeological Testing Report (see Appendix B), WSA archaeological staff were not able to conduct a pedestrian field survey of the area of the Undertaking because of the paved and inaccessible nature of the site. The Archaeological Testing Report contains further details on the results of the records search. At this time, no known archaeological historic properties appear to be located within the identified utility alignment or ADI. If archaeological materials are encountered during the Undertaking, construction will be halted, NASA's Procurement Officer and Historic Preservation Officer will be immediately notified, and the standard procedures outlined by WSA in Appendix B shall be followed. All necessary actions would be taken to comply with NASA and the Secretary of the Interior's Standards. Above-Ground Historic Properties

Above-ground historic properties located within MFA have previously been studied in efforts to inform an understanding of the historic significance of properties throughout the area. These studies were used to determine whether the construction of the Undertaking may have potential effects on historic properties within the APE. The studies include the following:

- *US Naval Air Station Sunnyvale, California Historic District National Register of Historic Places Nomination*, Bonnie Bamberg, Urban Programmers: 1994.
- *Evaluating Historic Resources Associated with the Space Shuttle Program: Criteria of Eligibility for Listing in the National Register of Historic Places (NRHP)*, Page & Turnbull: 2007.
- *Historic Property Survey Report for the Airfield at NASA Ames Research Center, Moffett Field, California*, AECOM: 2013.

Based on these previous studies, above-ground historic properties are known to exist within the APE and are listed in the table below. The Status/Evaluation column of the table denotes whether the properties: (1) contribute to an identified historic district, (2) are proposed as contributing properties, (3i) are individually eligible to the NRHP, or (4) have previously been found to be ineligible for the NRHP.

It should be noted that consultation between NASA and the California Office of Historic Preservation (OHP) expanded the boundaries of the NAS Sunnyvale Historic District to encompass the installation's airfield and adjacent aviation-related buildings and landscape features. The Historic Property Survey Report (HPSR) completed by AECOM and dated November 26, 2013 considered

resources associated with the airfield for contributing status under an expanded period of significance, 1930-1961, and a list of potential contributors was assembled. OHP has not formally concurred with this list of properties, but has found it appropriate to consider them as historic properties during subsequent Section 106 consultation.²

Detailed information on all of the historic properties (including their historic use and the criteria under which they were evaluated) can be found in the documents identified in the Previous Studies listed above. Those historic properties contained within the Undertaking's ADI, which have the potential to be affected physically by the Undertaking, are described in greater detail following the tables. Maps that show the locations of historic properties are included in Appendix A.

Table 1: Expanded NAS Sunnyvale National Register Historic District

Current Name/Historic Use (Building #)	Year Built	Status / Evaluation	Historic Property (see footnote 2)
Hangar One (1)	1931-1933	Found individually eligible to the NRHP through Section 106 review; contributing property to the NAS Sunnyvale Historic District	Yes
North Floodlight Tower (32)	1931-1933	Contributing property to the NAS Sunnyvale Historic District	Yes
South Floodlight Tower (33)	1931-1933	Contributing property to the NAS Sunnyvale Historic District	Yes
Hangar 2 (46)	1942-1943	Found individually eligible to the NRHP through Section 106 review; contributing property to the NAS Sunnyvale Historic District	Yes
Hangar 3 (47)	1942-1943	Found individually eligible to the NRHP through Section 106 review; contributing property to the NAS Sunnyvale Historic District	Yes
Boiler House for Hangars 2 and 3/Heat Plant (55)	1943	Contributing property to the NAS Sunnyvale Historic District	Yes
Inert Ammunition Storage (69)	1943	Proposed as contributing property to Expanded NAS Sunnyvale Historic District	Yes
Fuse & Detonator Magazine (70)	1943	Proposed as contributing property to Expanded NAS Sunnyvale Historic District	Yes
High Explosive Magazines (71-74)	1943	Proposed as contributing property to Expanded NAS Sunnyvale Historic District	Yes
Airfield Lighting Vault (105)	1947	Proposed as contributing property to Expanded NAS Sunnyvale Historic District	Yes

² Later this year, Page & Turnbull will evaluate the significance and integrity of the identified potential contributing properties to the Expanded NAS Sunnyvale Historic District, and will submit their findings to NASA. In the interim, all proposed contributing properties associated with the Expanded NAS Sunnyvale Historic District will be considered historic properties during Section 106 consultation.

Current Name/Historic Use (Building #)	Year Built	Status / Evaluation	Historic Property (see footnote 2)
Aircraft Compass Calibration Pad (106)	1947	Proposed as contributing property to Expanded NAS Sunnyvale Historic District	Yes
Tank Truck Filling Rack (141)	1952	Proposed as contributing property to Expanded NAS Sunnyvale Historic District; found ineligible as a component of the Jet Fueling Facility in AECOM, <i>Historic Property Survey Report for the Defense Fuel Point Closure Project</i> , 2016; SHPO concurred with this finding in letter to Keith Venter, NASA Ames Research Center, 6/30/2016	No
High Explosive Magazine (143)	1951	Proposed as contributing property to Expanded NAS Sunnyvale Historic District	Yes
High Explosive Magazine (147)	1951	Proposed as contributing property to Expanded NAS Sunnyvale Historic District	Yes
Flight Operations Building and Tower (158)	1954	Proposed as contributing property to Expanded NAS Sunnyvale Historic District	Yes
UHF/VHF Receiver Building (329)	1958	Proposed as contributing property to Expanded NAS Sunnyvale Historic District	Yes
Ordnance Handling Pad (442)	1956	Proposed as contributing property to Expanded NAS Sunnyvale Historic District	Yes
UHF/VHF Transmission Building (454)	1960	Proposed as contributing property to Expanded NAS Sunnyvale Historic District	Yes
Runway 32L/14R (MF1000)	1938	Proposed as contributing property to Expanded NAS Sunnyvale Historic District	Yes
Instrument Runway 32R/14L (MF1001)	1945	Proposed as contributing property to Expanded NAS Sunnyvale Historic District	Yes
Aircraft Parking Apron (MF1002)	1945	Proposed as contributing property to Expanded NAS Sunnyvale Historic District	Yes
High-Speed Aircraft Fueling Pits (MF1003)	1955	Proposed as contributing property to Expanded NAS Sunnyvale Historic District; found ineligible as a component of the Jet Fueling Facility in AECOM, <i>Historic Property Survey Report for the Defense Fuel Point Closure Project</i> , 2016; SHPO concurred with this finding in letter to Keith Venter,	No

Current Name/Historic Use (Building #)	Year Built	Status / Evaluation	Historic Property (see footnote 2)
		NASA Ames Research Center, 6/30/2106	
West Parallel Aircraft Taxiway (MF1016)	c. 1946	Proposed as contributing property to Expanded NAS Sunnyvale Historic District	Yes
East Parallel Aircraft Taxiway (MF1016)	c. 1946	Proposed as contributing property to Expanded NAS Sunnyvale Historic District	Yes
Connecting Taxiways (MF1016)	c. 1946	Proposed as contributing property to Expanded NAS Sunnyvale Historic District	Yes
Flight and Guidance Simulation Lab (N-243)	1967	Listed in the NRHP as an individual resource	Yes

Properties Within the Area of Direct Impact

Of the identified above-ground historic properties located within the APE and included in the tables above, several are located within the ADI. As such, these properties have the potential to be physically affected by the Undertaking.

Expanded NAS Sunnyvale Historic District

The Undertaking site is located at the northeast portion the Expanded NAS Sunnyvale Historic District, north-adjacent to Hangars 2 and 3; the proposed project site is located outside the boundary of the original NAS Sunnyvale Historic District. The original NAS Sunnyvale Historic District was listed to the NRHP in 1994. This discontinuous district includes the original portions of the NAS Sunnyvale installation campus, also known as Shenandoah Plaza, as well as Hangar 2, Hangar 3, and a small portion of the adjacent aircraft apron. The Expanded NAS Sunnyvale Historic District was identified as the result of consultation between NASA and the California Office of Historic Preservation in 2013. Through this consultation, the boundaries of the district were expanded to form a NRHP-eligible extension. The expanded district boundaries encompass the airfield, its associated runways, and various support buildings and structures, including the World War II-era ammunitions facilities at the northeast corner of the property.

The following are contributing properties within the NRHP-eligible Expanded NAS Sunnyvale Historic District that are located within the project footprint. As such, these properties are within the ADI and have the potential to be physically affected by the Undertaking:

- Inert Ammunition Storage (Building 69): constructed in 1943, Building 69 is a simple warehouse building that was historically used as a storage facility that house inert ammunition as support for the various military missions at MFA. The building is located at the north corner of the proposed parking area and adjacent to the bus circulation paths of travel associated with the Undertaking.
- Aircraft Parking Apron (MF 1002): constructed in 1945, the aircraft parking aprons include two large expanses of concrete surface paving located immediately adjacent to Hangars 1 on the west side of the airfield, as well as surrounding Hangars 2 and 3 at the east. The apron paving features a distinct gridded scoring pattern throughout. The proposed semi-permanent

structures and parking spaces of the Undertaking will be located on the paved surfaces of the northeastern-most portion of the east Aircraft Parking Apron.

V. APPLICATION OF THE CRITERIA OF ADVERSE EFFECT

The criteria of adverse effect on historic properties under Section 106 of the NHPA are defined in 36 CFR Section 800.5(a)(1) as follows:

An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

According to 36 CFR Section 800.5(a)(2), examples of adverse effects on historic properties include, but are not limited to:

- i. Physical destruction of or damage to all or part of the property;
- ii. Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Section 68) and applicable guidelines;
- iii. Removal of the property from its historic location;
- iv. Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
- v. Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;
- vi. Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and
- vii. Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

To comply with Section 106, the criteria of adverse effects are applied to historic properties in the Undertaking's Area of Potential Effects (APE), pursuant to 36 CFR Section 800.5(a)(1). A finding of no adverse effect may be appropriate when the undertaking's effects do not meet the threshold set forth in the criteria of adverse effect, or conditions are imposed to ensure review of rehabilitation plans for conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties (codified in 36 CFR Section 68). If a finding of adverse effects is made, mitigation is proposed and resolution of adverse effects occurs through consultation in accordance with 36 CFR Section 800.6(a) to avoid, minimize, or mitigate adverse effects on historic properties.

FINDING OF EFFECT

Per the adverse effects threshold detailed in CFR Section 800.5(a)(2), an analysis of the Undertaking reveals the following:

Criterion i. Physical destruction of or damage to all or part of the property.

The Undertaking would not damage or lead to the physical destruction of a portion or all of any historic property. Any potential physical impacts to historic properties are considered in the discussion of the Undertaking's adherence to the *Secretary of the Interior's Standards* under Criterion ii, below. The Undertaking therefore would not cause an adverse effect under Criterion i.

Criterion ii. Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Section 68) and applicable guidelines.

The following section includes an analysis of the Undertaking using the *Secretary of the Interior's Standards for Rehabilitation*. Rehabilitation is considered appropriate to define the Undertaking, as this treatment encompasses projects that "mak[e] possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values."³

Rehabilitation Standard 1: *A property will be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.*

The proposed Undertaking would not result in changes to the current use of any historic property. The proposed Bus Maintenance Facility is located at the northeast corner of the airfield, adjacent to South Macon Road and including a small northeast portion of east MF1002. The entire project site is currently being used for bus parking. As such, the Undertaking area will continue to be utilized for a similar use. While the portion of east MF1002 that is within the project area will shift in use from the existing bus parking to bus maintenance, the resulting changes will be limited to the introduction of the semi-permanent bus shelters in limited locations; the majority of east MF1002 will continue to exhibit its character-defining expansive, flat paved surface after the introduction of the bus maintenance component to the existing bus parking use.

The overall Bus Maintenance Facility will be placed outside the controlled area of the airfield and will have no effect on the existing aviation-related programs and uses of the sites; all of the nearby buildings and other features associated with the Expanded NAS Sunnyvale Historic District, such as Hangar 2, Hangar 3, the various taxiways, and the majority of east MF1002, will continue to be used as they are currently. The ongoing use of Building N-243, the individually eligible NRHP property located in the identified APE, will be entirely unaffected by the Undertaking and will continue to operate as a research related facility included within NASA ARC. Therefore, the Undertaking would adhere to Standard 1.

Rehabilitation Standard 2: *The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features and spaces that characterize a property shall be avoided.*

³ "Rehabilitation as a Treatment," National Park Service Technical Preservation Services, accessed January 6, 2017, <https://www.nps.gov/tps/standards/four-treatments/treatment-rehabilitation.htm>.

The Undertaking involves the construction of four semi-permanent structures that will be the primary constructed components of the Bus Maintenance Facility project. These will be located on a small northeast portion of east MF1002, which is a contributing property to the Expanded NAS Sunnyvale Historic District. These structures will be set on the paved surface of the parking apron and will not require the removal of any of the historic pavement. The structures will be anchored to the pavement; however, this will involve minimal physical intrusions, leaving the overall physicality of MF1002 preserved. The storage containers proposed for the site will be located on an adjacent paved area that is beyond the contributing east aircraft parking apron and will result in no physical alterations to the property. Similarly, the proposed utility alignment will be located beyond the significant spaces of east MF1002; thus, no historic materials will be removed because of the new pathways construction.

The proposed semi-permanent bus maintenance shelters and storage containers will be new above-ground introductions to east MF1002 and adjacent spaces, which are characterized by their flat, expansive, paved surfaces. These will be noticeable visual intrusions in this space with the potential to affect a number of historic properties throughout the Expanded NAS Sunnyvale Historic District. However, the potential visual impact will be reduced by their placement east of Hangars 2 and 3. First, the location of the proposed structures east-adjacent to the monumental hangars will remove them from most significant visual corridors throughout the airfield, as the structures will be blocked from view at most vantage points by the hangars. The historic spatial characteristics of the overall airfield will largely remain intact, except from certain areas at the northernmost end of the airfield. Second, the shelters are designed to be compatible with the overall utilitarian and aviation-related aesthetics of the airfield, particularly the nearby hangars. The proposed bus maintenance shelters will be regularly spaced and aligned with the hangars, reflecting both the configuration of the hangars and many of the smaller support buildings throughout the airfield. At the same time, these shelters will be significantly smaller than the hangars, both in footprint and height, maintaining the significant presence of the hangars in relation to the overall setting of MFA. The proposed shelters will also reflect an industrial material palette and feature design treatments, such as curvilinear roof lines, that will be complementary to the nearby historic properties and overall site. The storage containers will similarly be arranged in a regular pattern and feature an industrial character that is consistent throughout MFA. The remainder, and majority, of the Undertaking project site will continue to be used as a surface parking area. It will exhibit flat, expansive, paved areas, which is consistent with the historic characteristics of the Expanded NAS Sunnyvale Historic District.

All work being conducted adjacent to Building 69, a contributor to the Expanded NAS Sunnyvale Historic District, is limited to the painting of lines for parking stall lines on the existing pavement, which is already being used for surface parking. The continuation of the surface parking use in the adjacent spaces, coupled with the absence of prescribed work for Building 69 that would physically impact the resources, will have no effect on the character of the historic property.

Therefore, the Undertaking would adhere to Standard 2.

Rehabilitation Standard 3: *Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other buildings, shall not be undertaken.*

The Undertaking proposes the construction of semi-permanent bus maintenance shelters, storage containers, and the expansion of existing bus and automobile parking functions at the northeast corner of MFA. The construction of the new semi-permanent maintenance shelters and introduction of the storage containers will clearly be contemporary in construction and design, although they will have a utilitarian aesthetic that is consistent with the setting. Neither the bus maintenance shelters nor the storage containers will involve any conjectural features that could create a false sense of

history. The majority of the project site will remain in its existing condition as a large paved surface, which will continue to be utilized for vehicle parking and maintenance space.

Therefore, the Undertaking would adhere to Standard 3.

Rehabilitation Standard 4: *Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.*

The Undertaking would not adversely affect any properties or landscape characteristics that have acquired historic significance in their own right. The paved surfaces north and east of east MF1002 and south of Macon Road do not appear to convey any historic significance associated with the Expanded NAS Sunnyvale Historic District, MF1002, or as an individual resource. Additionally, the various security gates, guard stations, and other structures located around the established surface parking area do not appear to rise to a level of significance either. No alterations to east MF1002, such as areas where repaving occurred, appear to have gained significance in their own right. Therefore, the Undertaking would adhere to Standard 4.

Rehabilitation Standard 5: *Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.*

Building 69, while located within the ADI, will not be physically affected by the Undertaking. Work adjacent to Building 69 consists of repainting lines on the existing paved surface, which will not result in the alteration of any distinctive features, finishes, or construction techniques that characterize the resource.

The only historic property that is directly affected by the Undertaking is the northeast portion of east MF1002, north of Hangar 3 and south of Macon Road. The proposed semi-permanent bus maintenance shelters will be located on a portion of the paved surface of east MF1002. Although the shelters will slightly disrupt the visually expansive, flat, paved surface of this portion of the parking apron, much of the parking apron, which extends around both Hangars 2 and 3, will remain in its existing condition and will continue to exhibit the distinctive characteristics of the property. The bus maintenance shelters will require some anchoring to the paved surface in the select northeast portion of the parking apron; however, the physical impact will be limited to small connection points that will disturb the historic paved surface, which could be easily repaired upon future removal of the semi-permanent shelters (see Rehabilitation Standard 10). Overall, the vast majority of east MF1002 will remain in its existing condition and will continue to exhibit its expansive, flat, grid-lined paved surface.

Therefore, the Undertaking would adhere to Standard 5.

Rehabilitation Standard 6: *Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.*

The Undertaking would not involve the treatment of any deteriorated features belonging to a historic property. In the event that any portions of east MF1002 require repairs during the Undertaking, these repairs will be conducted via appropriate treatment methods; any and all replacements, if warranted, will be made in-kind with the surrounding historic materials.

Therefore, the Undertaking would adhere to Standard 6.

Rehabilitation Standard 7: *Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, will be undertaken using the gentlest means possible.*

The Undertaking would not involve harmful chemical or physical treatments of any historic materials belonging to a historic property. Therefore, the Undertaking would adhere to Standard 7.

Rehabilitation Standard 8: *Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.*

No archaeological resources are known to be located in the areas where below ground disturbances are occurring, primarily along the proposed utility alignment. If archaeological materials are encountered during the Undertaking, construction will be halted, NASA's Procurement Officer and Historic Preservation Officer will be immediately notified, and the standard procedures outlined by WSA in Appendix B shall be followed. All necessary actions would be taken to comply with NASA and the Secretary of the Interior's Standards. Therefore, the Undertaking would adhere to Standard 8.

Rehabilitation Standard 9: *New additions, exterior alterations, or related new construction will not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale and architectural features to protect the historic integrity of the property and its environment.*

As described previously, the Undertaking involves the construction of semi-permanent Bus Maintenance Facilities. This involves the construction of four bus maintenance shelter structures, located on a small portion of the northeast corner of the historic east MF1002, as well as the placement of 12 storage containers east-adjacent to the parking apron on non-historic surfaces. Both the bus maintenance shelters and the storage containers will be differentiated from contributing properties to the Expanded NAS Sunnyvale Historic District through their contemporary construction, while being compatible through their utilitarian aesthetic, industrial material palette, and overall scale and massing, which is comparable to other buildings located along the periphery of the airfield.

The semi-permanent bus maintenance shelters will be located on a portion of the historic east MF1002, at the northeast corner. These structures will be placed on a small portion of the expansive paved surface and will only require minimal physical intrusions to the historic pavement to anchor the structures; no footings will be constructed. These shelters will disrupt the flat nature of the parking apron by the installation of above-ground structures; however, much of the paved surface will be completely uninterrupted and left in its existing condition, especially at the areas adjacent to the airfield where visual openness is most significant. Overall, the shelters will be differentiated by their contemporary construction. At the same time, the comparatively small footprint of the bus maintenance shelters in relation to the overall parking apron, their placement at the periphery of the airfield behind Hangar 3, and their utilitarian aesthetic, comparable to other support buildings located around the airfield, will ensure a degree of compatibility with the parking apron.

The most significant adjacent historic properties to the Undertaking are Hangars 2 and 3. Hangar 3, specifically, is located closest to the proposed semi-permanent bus maintenance shelters. As stated previously, the shelters will be differentiated from the hangars by the contemporary construction, size, and use. They will be compatible, however, through several design features. First and foremost, the bus maintenance shelters will have a height of 34', which is significantly smaller than the monumental size of the adjacent Hangars. The Hangars are some of the largest and most definitive

of the historic district, and the shelters' subservient scale will maintain this aspect of the site, thus making them compatible by not visually competing. At the same time, the height of the proposed bus maintenance shelters is comparable to the height of the east brick masonry shed of Hangar 3, acknowledging an established datum of the property. Additionally, the bus shelters are sited parallel to the Hangars and feature large vehicle openings at the north and south facades, reflecting the circulation patterns associated with the Hangars. The shelters feature curved, parabolic rooflines with lighter materials and exposed structural framing, which are also characteristics of the nearby hangars. As such, the proposed bus maintenance shelters will be both differentiated and compatible with the adjacent Hangars.

The proposed storage containers will be differentiated as clearly contemporary interventions near the airfield; however, they will be compatible through their overall utilitarian aesthetic and industrial vocabulary. They will also be similar to other prefabricated and simple support buildings found throughout the airfield, including the small collection of buildings and structures located in the narrow area directly between Hangars 2 and 3. The placement of these structures along the periphery of the airfield and adjacent to the semi-permanent bus maintenance shelters will clearly differentiate these buildings from the contributing aviation related buildings simply by proximity to the new bus-oriented use.

Therefore, the Undertaking would adhere to Standard 9.

Rehabilitation Standard 10: *New additions and adjacent or related new construction shall be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.*

Given that the bus maintenance shelters associated with the Undertaking are intended to be temporal by design, in the event that the proposed elements of the Undertaking are removed in the future, all historic properties would easily be reverted to their existing condition. As part of the installation of the bus maintenance tents, the paved surface of the historic east MF1002 will be retained in its existing condition. Only minimal in-kind repairs would be required at the small anchor points where the structures would be attached to the ground, otherwise east MF1002 would revert to its existing condition. The storage containers will simply be placed on the paved surfaces of the parking apron and could be removed with no effect to the historic property.

Therefore, the Undertaking would adhere to the Standard 10

Summary of Analysis under Criterion ii

The Undertaking would adhere to the *Secretary of the Interior's Standards for Rehabilitation*, as described above, and therefore would not cause an adverse effect to historic properties under Criterion ii.

Criterion iii. Removal of the property from its historic location.

The Undertaking would not involve the removal of any historic property from its historic location and therefore would not cause an adverse effect to historic properties under this criterion.

Criterion iv. Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance.

Potential Effect of the Undertaking on Use:

The proposed Undertaking would be limited to the northeast corner of the airfield, between Hangar 3 and Macon Road. As described previously under Criterion ii, the Bus Maintenance Facility will be

located outside the controlled area of the airfield and will have no effect on the aviation-related uses of the airfield and many of the contributing properties located within the identified APE.

As for properties located in the ADI, these properties will continue to be used in a comparable way to their existing use. East MF1002 will largely be retained in its existing condition, although the Undertaking will use a small portion of the property for the proposed semi-permanent bus maintenance shelters. While this portion of MF1002 will not be used as it was historically for the parking and maintenance of aircraft, this expansive, flat, paved surface area will be utilized for the same purposes for buses. The project site is currently being utilized for bus parking, so the only shift in use is limited to the introduction of the semi-permanent bus maintenance component. This nuanced change in use will involve some physical changes to a small portion of east MF1002 via the introduction of new structures on top of the apron, although much of the parking apron will retain its existing use and condition. Building 69, which is also located in the Undertaking's ADI and is currently a vacant warehouse, will not be affected by the proposed project. The surrounding area will continue to be utilized as a surface parking lot for buses and no change will occur as a result of the Undertaking.

Potential Effect of the Undertaking on Physical Features within the Property's Setting:

The proposed above-ground components have the potential to affect the visual relationships and other spatial characteristics of historic properties associated with the Expanded NAS Sunnyvale Historic District. The 2013 HPSR that identified the Expanded NAS Sunnyvale Historic District specified visual relationships that assisted in conveying significance of the airfield. The HPSR identified the “expansive, open view from the south end of the runways looking north toward San Francisco Bay”⁴ as the primary significant view from the airfield towards its setting. Building upon this point, the HPSR specifically analyzed the historic district's setting and recognized that other areas surrounding the airfield have experienced new development since the end of the identified period of significance, 1961, but that this surrounding non-historic development does not impinge on the historic district's ability to convey its historic significance. In discussing the historic district's setting, the HPSR states,

Still, the visual relationships—most importantly to Hangar 1, but also to the bay and salt ponds to the east and north, and to Shenandoah Plaza and other features of the NAS Sunnyvale Historic District to the west—remain similar to their historic appearance before 1961, and continue to define the site's setting as they have since the 1930s. Therefore, integrity of setting is retained.⁵

As such, the HPSR acknowledged that the expanded district's significance as a long-operating airfield was most dependent on internal spatial and visual relationships among the Shenandoah Plaza administrative campus, the large hangars anchoring the airfield, and the various runways and taxiways situated at the center of the airfield. Views towards the airfield's setting to the west, south, and east are far less important in conveying the district's grounds for historical and architectural significance.

As described previously, the proposed Bus Maintenance Facility would be located at the periphery of the airfield, between Hangar 3 and Macon Road. According to the 2013 HPSR, much of the areas surrounding the airfield have undergone alterations with new construction, which has left the integral central spaces of the airfield intact. The placement of the Undertaking on the periphery of the airfield will continue to preserve these central airfield spaces by removing the proposed structures from the central spaces defined by the flat, expansive surfaces of the runways, taxiways, and insular portions of

⁴ HPSR, p. 4-3.

⁵ Ibid., p. 5-3.

east MF1002. Also, this placement east-adjacent to the monumental Hangars 2 and 3 will obscure the proposed Bus Maintenance Facility entirely from the most significant visual corridors associated with the Expanded NAS Sunnyvale Historic District's setting, including across the airfield from Hangar 1 and from the southern end looking north towards San Francisco Bay. The proposed Bus Maintenance Facility will likely not be visible from the northern end of the airfield, looking south. The existing golf course and other airfield structures at the northeast end of the historic district will likely block the proposed Bus Maintenance Facility from view from most vantage points at the northern end of MFA. It should also be noted that the minimal height of the proposed structures, especially in relation to the hangars, will not likely be perceptible from these northern vantage points at the airfield, which are at a distance of approximately 5,000 feet from the Undertaking site.

The setting of Hangars 2 and 3 will be somewhat affected by the introduction of the proposed structures. Currently, the immediate setting of the hangars is largely defined by east MF1002, which surrounds the buildings and enhances the monumentality of the structures through the juxtaposition of the apron's expansive, flat surface. Small support buildings and structures set between the two hangars are also important components of the hangars' setting. The proposed Undertaking would leave the majority of east MF1002 in its existing condition, particularly at the north, west, and south sides, which are closest to the significant central features of the airfield. The proposed bus maintenance structures would be limited to the northeast periphery of the parking apron. As described previously, these structures will be designed to be compatible with the hangars and reduce their impact on the hangars' setting. The reduced height and footprints will not infringe upon the monumentality of the hangars, while the curvilinear roof, regular spacing and careful alignment, as well as industrial vocabulary of the structures will reflect both the hangars and the nearby support buildings also found within the hangars' setting. Additionally, the temporal nature of the elements further reduces the potential effects of the proposed structures on the setting of the hangars. Cumulatively, these aspects associated with the Undertaking, as well as the conscious placement at the periphery of the airfield parking apron, will reduce the potential of the proposed project to have an adverse effect on the hangars' setting.

Therefore, the Undertaking would not cause an adverse effect to the character of historic properties under this criterion.

Criterion v. Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features.

As described in the Identification of Historic Properties section of this report, the Undertaking's APE has been found to contain historic properties that could potentially experience indirect effects—such as the introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's historic features—as a result of the Undertaking.

Visual Effects:

The preceding discussion of setting explains that the HPSR identified several visual relationships with the Expanded NAS Sunnyvale Historic District that relate to the district's historic significance. The most important of these are views towards Hangar 1, the most prominent building within the installation, from various points within the boundaries of the historic district, such as the main gate along Moffett Boulevard at the west edge of Shenandoah Plaza, as well as from Hangars 2 and 3 and from points throughout the airfield's central runways. An additional view identified by the HPSR is one that is available from the control tower of the Flight Operations Building (Building 158) towards the runways and taxiways and the aviation-related buildings that line the east and west edges of the airfield. The Undertaking, which will be blocked visually by Hangars 2 and 3 from the east perspective, will not infringe upon most of these identified significant visual corridors. The visual

connections from the northern portion of the airfield have the potential to be affected, although the modest height and compatible design of the proposed structures, coupled with the large distances and other obstructing features between the vantage points and said structures, reduce this potential for effect. These previously discussed facets would cumulatively reduce the visual impact of the Undertaking on the character-defining features on the historic district.

Specific to the setting of Hangars 2 and 3, which is largely defined by the vast, paved surfaces of east MF1002 and adjacent taxiways with support buildings at the periphery, the Bus Maintenance Facility would encroach upon some of these spaces. However, the placement of the bus maintenance shelters at the northeast corner towards the perimeter of east MF1002 will leave the majority of these expansive surfaces uninhibited while also reflecting the pattern of peripheral airfield support facilities. As such, the visual aspects of the Undertaking will have an effect on the setting of the Hangars, but not to an extent that would reduce the integrity of setting to a point where it is no longer retained.

Therefore, the Undertaking would not have an adverse effect on the historic setting of any properties to a point that would greatly diminish the historic integrity.

Atmospheric Effects:

Under the conditions described for the Undertaking, an increase in atmospheric effects would largely be related to construction. This would be temporary in nature and not have any long-term effects on the integrity of setting of any historic properties. While the Undertaking involves the construction of a Bus Maintenance Facility, this will have negligible effects on the setting, given that the majority of the identified APE and paved surfaces in that area is already being utilized as bus surface parking and servicing. As such, the Undertaking would not result in any adverse atmospheric effects that would affect the historic integrity of any historic properties.

Audible Effects:

Under the conditions described for the Undertaking, the majority of audible elements to be introduced will occur during the construction phase of the project. These audible aspects will be temporary in nature and will have no lasting effect on the integrity of any of the identified historic properties. As for longer term audible effects, these are associated with ongoing bus traffic and vehicle maintenance. As described previously, much of the proposed Undertaking site is currently used as bus parking, so the expansion of this existing use will have little effect on the existing audible conditions of the area, especially compared to the audible effects of an active existing airfield. Therefore, the Undertaking would not cause any adverse audible effect to the historic integrity of any historic properties.

In summation, the Undertaking would not cause an adverse effect to historic properties under this criterion.

Criterion vi. Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization.

The Undertaking would not involve the neglect of a property that causes its deterioration. Therefore, the Undertaking would not cause an adverse effect to historic properties under this criterion.

Criterion vii. Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

The Undertaking would not involve the transfer, lease, or sale of property out of Federal ownership or control and therefore would not cause an adverse effect to historic properties under this criterion.

Summary of Finding of Effect Analysis

The analysis provided in this section demonstrates that the proposed Undertaking would have no direct adverse effects. Although historic properties were identified in the APE, all proposed work complies with the Secretary of the Interior's Standards for Rehabilitation, the other Section 800.5(a)(2) criterion, and would not alter the character and integrity of said properties, nor their ability to convey historic significance. The Undertaking would not result in any change to the character of a property's use or of physical features within a property's setting that contribute to its historic significance, and would not introduce visual, atmospheric, or audible elements that would diminish the integrity of a property's significant historic features. For these reasons, Page & Turnbull concludes that the Undertaking would result in no adverse effects on historic properties, and recommends a finding of No Adverse Effect.

V. CONCLUSION

The Undertaking, involving the construction of a Bus Maintenance Facility, would not have the potential to alter, directly or indirectly, any of the characteristics that qualify a historic property for inclusion in the National Register. After consideration of the criteria of adverse effect, pursuant to 36 CFR Part 800.5(b), this analysis concludes that the Undertaking will result in no adverse effects on historic properties. As such, Page & Turnbull recommends a finding of No Adverse Effect.

APPENDIX A: MAPS

- A-1 Map of the Undertaking
- A-2 The Undertaking's Area of Potential Effects (APE) and Identified Historic Properties
- A-3 The Undertaking's Area of Direct Impacts (ADI) and Identified Historic Properties

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Figure A-1: Map of the proposed Undertaking. Source: Page & Turnbull, 2017.



Figure A-2: The Undertaking's Area of Potential Effects (APE) and identified historic properties.
Source: Page & Turnbull, 2017.



Figure A-3: Map of the Area of Direct Impacts (ADI) and adjacent historic properties.
Source: Page & Turnbull, 2017.

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Appendix B, C, an D are redacted from this public posting.