

Memorandum

To: Jonathan Ikan, Cultural Resources Manager, NASA Ames Research Center
CC: Fabian Bonaldi, AECOM
Subject: Section 106 Consultation for the Fall Protection Project, NASA Ames Research Center, Moffett Field, Santa Clara County, California
From: Trina Meiser, Senior Architectural Historian
Heather Miller, Architectural Historian
Date: December 4, 2023

1. Introduction

The National Aeronautics and Space Administration (NASA) Ames Research Center (ARC) proposes the Fall Protection Project (project or undertaking) at NASA ARC, Moffett Field, Santa Clara County, California. As the lead federal agency, NASA is responsible for compliance with Section 106 of the National Historic Preservation Act of 1966 (54 United States Code §306108), as amended, which requires federal agencies to take into account the effects of their activities and programs on historic properties, and its implementing regulations in 36 Code of Federal Regulations (CFR) Part 800. The purpose of this memorandum is to provide necessary information for compliance with Section 106, including a description of the undertaking and the Area of Potential Effects (APE), the methodology used to identify and evaluate historic properties within the APE, a description of the affected historic properties, and an assessment of potential effects resulting from the undertaking.

1.1 Project Location

The proposed project is at eight buildings on NASA Ames Campus at NASA ARC, Moffett Field, Santa Clara County, California: Buildings N203, N210, N215, N220, N230, N238, N239A, and N260 (see Figures 1 and 2 in Appendix A):

1. Building N203 is 140 feet south of the intersection of DeFrance Avenue and King Road at the center of Bush Circle. It is a contributor to the proposed National Advisory Committee for Aeronautics (NACA) Ames Historic District (NACA District), which is potentially eligible for listing in the National Register of Historic Places (NRHP) (see OHP NASA_2021_0525_001).
2. Building N210 is at the southwest corner of King Road and Copper Loop. It contributes to the proposed NACA District.
3. Building N215 is at the northwest corner of Durand Road and McCord Avenue. It contributes to the NRHP-listed NASA Ames Wind Tunnel Historic District (NRHP #100000470) and the proposed NACA District.
4. Building N220 is at the northeast intersection of DeFrance Avenue and King Road. It contributes to the NRHP-listed NASA Ames Wind Tunnel Historic District and the proposed NACA District.
5. Building N230 is 250 feet west of the intersection of Boyd Road and Mark Avenue. This building's NRHP eligibility has not been evaluated, but it is considered NRHP eligible for the purposes of this project.
6. Building N238 is at the southwest intersection of Hunsaker Road and Mark Avenue. It is listed in the NRHP as part of the Arc Jet Complex (NRHP #100000466).
7. Building N239A is 300 feet east of the intersection of King Road and McCord Avenue. This building's NRHP eligibility has not been evaluated, but it is considered NRHP eligible for the purposes of this project.
8. Building N260 is at the northeast intersection of Hunsaker and DeFrance avenues. This building is ineligible for listing in the NRHP because it is less than 50 years old and does not demonstrate exceptional significance under Criteria Consideration G.

1.2 Project Personnel

This study was conducted by cultural resources professionals who meet the Secretary of the Interior's Professional Qualifications Standards (48 Federal Register 44738). Trina Meiser, M.A., Senior Architectural Historian, served as the Principal Investigator; Heather Miller, M.A., prepared this report; Rob'yn Johnston provided map figures; and Kirsten Johnson, M.A., served as the lead verifier of this document.

2. Description of the Undertaking

NASA proposes to install fall protection guardrails on the roofs of Buildings N203, N210, N215, N220, N230, N238, N239A, and N260 for life-safety requirements. Currently, none of these buildings have rooftop fall protection except for an approximately 50' section on the south end of the west side of Building N210 that would be removed and replaced as part of the proposed project.

New fixed guardrails would be attached to the inside of the roof parapets at Buildings N203, N210, N215, N220, N230, and N260. The fixed guardrails consist of metal pipe top rails and midrails spaced a maximum of 19" apart. The guardrails would be attached to metal pipe railing posts that vary in height between 39" to 45" above the roof surface and are placed at 8' maximum intervals (see Section 7 and 8 on Sheet S-501 in Appendix B).

At Buildings N238 and N239, a non-permanent ballasted railing system would be installed. This type of railing system uses weighted bases instead of mounting plates (see Appendix C) and has the same height criteria as the fixed systems and vary in height between 39" to 45" above the roof surface. This style of fall protection guardrails was selected for Buildings N238 and N239 because it was deemed structurally infeasible to attach railing systems to these buildings.

Project drawings and locations of the fall protection guardrails on the buildings are provided in Appendix B, and the Accu-Fit Safety Railing product data sheet for the ballasted railing system is Appendix C.

3. Area of Potential Effects

The APE is defined to address both direct and indirect impacts on known and potential historic properties and encompasses areas that may be affected by both temporary and permanent construction activities. The APE overlaps with the NRHP-listed NASA Ames Wind Tunnel Historic District and the proposed NACA District and accounts for potential effects on the entire districts. However, because the project proposes installation of rooftop fall protection guardrails that would result in limited visual impacts to the immediate surroundings of the buildings, the discontinuous APE focuses on each location where the guardrails would be installed and includes a 50' buffer around each building footprint to encompass any associated buildings (see Appendix A; Map Figure 3). No below-grade activities are proposed for this project, so consideration of archaeological resources is not included.

4. Identification of Historic Properties

Historic properties are defined as any district, site, building, structure, or object that is included in, or is eligible for listing in, the NRHP. The APE has been previously surveyed for architectural resources that have been evaluated for NRHP eligibility. The following sections address the methodology and efforts to identify historic properties in the APE.

4.1 Architectural Resources

The APE includes the buildings within the proposed project area and three additional buildings within the 50' buffer (see Appendix A, Figure 3). A summary of the architectural resources in the APE and their historic property status are summarized below in Table 1.

Table 1. Architectural Resources in the APE

Building Number and Name	Built Date	NRHP Evaluation Status	Effects Analysis
Building N203 – Administration Support Building	1942	potential contributor (proposed NACA District); not individually eligible	no adverse effect

Building Number and Name	Built Date	NRHP Evaluation Status	Effects Analysis
Building N210 – Flight Systems Research Lab	1941	potential contributor (proposed NACA District); not individually eligible	no adverse effect
Building N215 – NASA/Army Aerodynamics & Health Unit	1941	listed contributor (NASA Ames Wind Tunnel Historic District); potential contributor (proposed NACA District)	no adverse effect
Building N220 – Technical Services Building	1940	listed contributor (NASA Ames Wind Tunnel Historic District); potential contributor (proposed NACA District)	no adverse effect
Building N230 – Physical Science Research Lab	1960	not formally evaluated; assumed eligible for this project	no adverse effect
Building N234 – Thermal Protection Lab	1962	listed in the NRHP (Arc Jet Complex)	no adverse effect
Building N238 - Arc Jet Lab	1964	listed in the NRHP (Arc Jet Complex)	no adverse effect
Steam Vacuum System	1962	listed in the NRHP (Arc Jet Complex)	no adverse effect
Building N239 – Life Science Lab	1965	not formally evaluated; assumed eligible for this project	no adverse effect
Building N239A – Life Science Lab High Bay / 50' Diameter Low-G Simulator 1	1966	not formally evaluated; assumed eligible for this project	no adverse effect
Building N260 – Fluid Mechanics Lab	1987	not eligible (less than 50 years old and does not demonstrate exceptional significance under Criteria Consideration G)	no effect

NOTE: Shaded rows are resources within the 50' buffer.

4.2 Prior Studies

Prior studies have identified and evaluated historic properties in the APE. Table 2 lists relevant evaluation efforts.

Table 2. Previous Built Environment Studies in the APE

Date	Author	Title	Findings
2007	Page & Turnbull, Inc.	<i>Evaluation of Historic Resources Associated with the Space Shuttle Program at Ames Research Center</i>	Buildings N238 and N243 recommended eligible for listing in the NRHP under Criterion A and Criteria Consideration G.
2014	AECOM	<i>Integrated Cultural Resources Management Plan – NASA Ames Research Center</i>	Summarized previous identification and evaluation efforts; provides historic context for Ames Research Center.
2016	AECOM	<i>National Register Nomination for the Arc Jet Complex – Building N-234, Building N-238, Steam Vacuum System</i>	Nominated Arc Jet Complex, which consists of Buildings N234, N238, and the Steam Vacuum System; listed in 2017.
2016	AECOM	<i>National Register Nomination for the NASA Ames Wind Tunnel Historic District</i>	Nominated historic district with five contributing facilities to the NRHP, including nine buildings: N215, N220, N221 and N221B, N226, and N227 and N227A-C; listed in 2017.
2021	Kleinfelder	<i>Section 106 Technical Memorandum for Moffett Field Site 28 Vapor Intrusion Project</i>	Assumed Building N239 eligible for the purposes of that project.
2022	AECOM	<i>Section 106 Technical Memorandum for the Building N204A Window Replacement Project</i>	Identified and evaluated potential NACA District based on common historical and

			architectural themes; identified N203, N210, N215, N220 as potential contributors.
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4.2.1.1 Evaluation of Historic Resources Associated with the Space Shuttle Program (SSP) at Ames Research Center (Page & Turnbull 2007)

In 2007, Page & Turnbull completed a SSP thematic study and assessment of 11 resources located at ARC. Each identified resource was evaluated utilizing specialized criteria developed between NASA and the National Park Service. In addition to evaluating each structure with NRHP Criteria A–D, the structures were evaluated with attention to Criteria Considerations B and G. Of the 11 resources surveyed, N238 (Arc Jet Laboratory) and N243 (Flight and Guidance Simulation Laboratory) were determined to meet NRHP criteria within the context of the SSP under Criterion A and Criteria Consideration G. The remaining nine resources were found not eligible for listing in the NRHP. Two of these nine resources, N221 and N227A-C, were previously found NRHP-eligible for other historical associations (Page & Turnbull, Inc. 2005), and N227 is a National Historic Landmark.

4.2.1.2 Integrated Cultural Resources Management Plan (ICRMP) – NASA Ames Research Center (AECOM 2014)

In 2014, AECOM completed an ICRMP for NASA Ames Research Center. The ICRMP outlines procedures for the identification, evaluation, and protection of cultural resources for cultural resources management staff. The ICRMP included the evaluation status of properties at NASA Ames based on previous survey efforts.

4.2.1.3 NRHP Nomination for the Arc Jet Complex (AECOM 2016a)

In 2016, AECOM prepared the nomination for the Arc Jet Complex that consists of Buildings N234, N238, and the Steam Vacuum System (SVS) and was listed in 2017.

4.2.1.4 NRHP Nomination for the NASA Ames Wind Tunnel Historic District (AECOM 2016b)

In 2016, AECOM prepared the nomination for the NASA Ames Wind Tunnel, which was listed in January 2017. Building N215 was identified as a contributor.

4.2.1.5 Section 106 Technical Memorandum for the Moffett Field Site 28 Vapor Intrusion Project (Kleinfelder 2021)

In 2021, Kleinfelder prepared a Section 106 consultation memorandum for proposed Vapor Intrusion Remediation on several building at NASA Ames, including Building N239. At the time of preparation, the building was 56 years old but had not been formally evaluated for NRHP eligibility and was assumed eligible for the purposes of the project. The project resulted in No Adverse Effect (see OHP NASA_2-21_1213_001).

4.2.1.6 Section 106 Technical Memorandum for the Building 204A Window Replacement Project (AECOM 2022)

In 2022, AECOM conducted a study for NASA ARC's Building N204A Window Replacement Project. The study included a survey and evaluation for a potential historic district and identified the potential NACA District. Buildings N203, N210, N215, and N220 were identified amongst 14 potential contributors. NASA ARC consulted with the SHPO on the project (see OHP NASA_2021_0525_001), but concurrence on the potential NACA District has not yet been received. This study assumes that the potential NACA District is eligible for the NRHP.

5. Affected Historic Properties

5.1 NASA Ames Wind Tunnel Historic District

The NASA Ames Wind Tunnel Historic District was listed in the NRHP in 2017. The district consists of five contributors, including Building N215 and N220, and 10 non-contributors. Contributing structures primarily are wind tunnels and buildings that support the functions of the wind tunnels. Although many of the structures have their own building numbers, they are functionally related and connected, and are counted as one resource. Located within the NASA Ames campus, the district is surrounded by various administrative and research-related buildings that represent successive eras of the campus's development. Within the district are mature trees, shrubs, manicured lawns, and hardscape features (i.e., DeFrance Avenue and Durand Road) that contribute to its landscape and setting. The district meets NRHP Criterion A in the areas of science, invention, and engineering at the national level of significance because this district contributed greatly to advancements in the aeronautical and space industries and the evolution of wind tunnel technology in the United States. The district also is eligible under NRHP Criterion C in the area of engineering because the wind tunnels represent a

significant work of engineering. The period of significance begins with the construction of Building N220 in 1940 and ends in 2011, the year that the SSP ended. The district retains all seven aspects of integrity and has the ability to convey its significance at the national level. The tunnels and their supporting buildings performed critical roles in aeronautical research and design and were among the most sophisticated scientific tools constructed and used by the U.S. government and commercial businesses. The research conducted within the wind tunnels was crucial to aircraft and spacecraft research and design. As the district's period of significance extends to a time period less than 50 years old, the district meets the requirements of Criteria Consideration G because the facility is exceptionally significant as the leading research and development facility in the areas of aeronautics and space in the United States.

5.1.1 Building N215 (also see Section 5.2)

Building N215 is listed in the NRHP as contributor to the NRHP-listed NASA Ames Wind Tunnel Historic District and identified as a contributor to the proposed NACA District, which is potentially eligible for listing in the NRHP. The Streamline Moderne-style two-story building was constructed in 1941 and is associated with a 7' X 10' wind tunnel (**Photograph 1**). The building is at the northwest corner of McCord Avenue and Durand Road and has a complex footprint, a flat roof with a shallow parapet, concrete walls, and a concrete foundation. The south end of the building has a simple massing and minimal ornamental detail with simple, flat, horizontal concrete bands. The building has three-over-three awning windows arranged in sets of either three or four and separated by concrete piers with grooves that align with the window mullions. The windows along the south side are steel sash, and the east and west elevations have wood sash windows. The north elevation features a combination of steel and wood sash windows. The building's primary entrance south the southern-facing façade is covered by a concrete, cantilevered awning with rounded corners (**Photograph 2**). The entry doors are aluminum frame and glass storefront double-leaf doors. There are steel and concrete stair additions to the building. There is an addition on the north elevation connects to the wind tunnel. The wind tunnel has been altered several times and is made up of several distinct structures. All have steel framing; some have the framing exposed. An exterior entry into the wind tunnel is located on the east elevation of the building (**Photograph 3**). The building's Streamline Moderne features include its concrete construction, emphasis on the horizontal through the use of banding and scoring, industrial windows (tripartite), tripartite scoring, flat roof with no overhang, a central entrance with rounded edge cantilevered canopy, signage "NASA 7 x 10 FT WIND TUNNEL" above door incised into concrete, and the vertical lines flanking entry doors. The building has undergone some alterations including a window set removed and infilled with a personnel door, and replacement entries under some canopies.



Photograph 1. West and south sides of Building N215, view to northeast.



Photograph 2. Primary entry in Building N215 on southern-facing façade, view to north.



Photograph 3. East side of Building N215, view to west.

5.1.2 Building N220 (also see Section 5.2)

Building N220 is listed in the NRHP as contributor to the NRHP-listed NASA Ames Wind Tunnel Historic District and is identified as a contributor to the proposed NACA District, which is potentially eligible for listing in the NRHP. Building N220 was built in 1940 and is a two-story Streamline Moderne-style office building (**Photographs 4 and 5**).



Photograph 4. West and south sides of Building N220, view to northeast.



Photograph 5. North and west sides of Building N220, showing hangar door, view to southeast.

It is located at the southeast corner of Durand Road and DeFrance Avenue and has a roughly rectangular footprint, a flat roof with a shallow parapet, concrete walls, and a concrete foundation. The building's massing is simple, and ornamental detail is limited to flat, horizontal concrete bands that run across each elevation. The building has three-over-three metal awning windows generally arranged in sets of four. Each set of windows is separated by concrete piers with grooves that align with the window mullions. The building's primary entrance is covered by a cantilevered concrete awning with rounded corners. The signage at the entrance reads "NACA Technical Service" which is incised into concrete. Three vertical lines flank the entry doors, which are a replacement aluminum frame and glass double-leaf storefront units. The north elevation has a pair of full-height, horizontal metal hangar doors (see **Photograph 5**). These rolling sectional doors have ribbon glazing that aligns with the windows on both the first and second floor. A corrugated metal shed with a low-pitched shed roof is attached on the east elevation. The building's Streamline Moderne features include its concrete construction, emphasis on the horizontal through the use of banding and scoring, industrial windows (tripartite), tripartite scoring, flat roof with no overhang, central entrance with rounded edge cantilevered canopy, "NACA Technical Service" above door incised into concrete, three vertical lines flanking entry doors, full-height hangar doors w/ multi-light windows, solid metal panels, and inset personnel doors. The building has undergone some alterations including replacement doors and the side shed addition.

5.2 NACA District

The proposed NACA District includes 14 potential contributors. All 14 potential contributors, including Buildings N203, N211, N215, and N220, were identified based on their thematic Moderne architectural features and associations with the development of the NACA Ames Aeronautical Laboratory. Developed between 1939 and 1955, the NACA District is significant under NRHP Criterion A for its association with the development of the second NACA aeronautical laboratory (the first on the West Coast) in anticipation of World War II and continued postwar research; and under NRHP Criterion B for its association with Smith J. DeFrance, Engineer-in-Charge/Director, and John F. Parsons as Construction Lead/Assistant Director, who designed the campus. The district is also significant under NRHP Criterion C for exemplifying the Moderne architectural style used on early NACA-era campuses as part of a building campaign to express modernity with an economic design, and for its representation as a significant and distinguishable entity whose components may lack individual distinction. The period of significance for the NACA District begins in 1939 with the establishment of the NACA Ames Aeronautical Laboratory and ends in 1955 with the shift towards early space research projects and the construction of the last building utilizing Streamline Moderne architecture during the NACA period. Overall, the NACA District retains sufficient historic integrity to physically convey its historic significance.

The character-defining features of the 14 contributing resources to the NACA Ames Historic District that convey Art Deco and Streamline Moderne designs part of the building program under DeFrance and Parsons during the NACA era (1939-1955) are:

- concrete exteriors,
- horizontal banding/scoring,
- industrial windows in groups (typically metal),
- metal entry doors,
- tripartite scoring/banding,
- flat roof with no overhang,
- metal flashing along the roofline,
- entrances with rounded edge cantilevered concrete canopies,
- incised logos/signs/decorative vertical lines around main entrances under cantilevered canopies, and
- symmetrical designs.

5.2.1 Building N203

Building N203 is a contributor to the proposed NACA District. Building N203 was constructed in 1942 as the Science Laboratory and is a two-story, Streamline Moderne-style building with a partial basement (**Photographs 6 and 7**). The reinforced concrete building has a rectangular plan and a flat roof line with a shallow parapet. The smooth concrete exterior features horizontal scored concrete pilasters at the corners and between the multi-light steel frame hopper window groupings. Primary entry into the building is centrally located on the west side and includes a pair of non-original, glazed aluminum frame doors with no sidelights or transom

shaded by a flat, cantilevered concrete awning with rounded corners. A flush metal entry door is in the north side, and second-story entry doors accessed by large, external metal staircases are on the south side and the north end of the east side.



Photograph 6. Western-facing façade of Building N203, view facing northeast.



Photograph 7. North and east sides of Building N203, view facing southwest.

5.2.2 Building N210

Building N210 is a contributor to the proposed NACA District and was built in 1941 as the Flight Research Laboratory. This Streamline Moderne-style monolithic hangar features Art Deco and Contemporary elements and was the first permanent structure at NACA Ames (**Photograph 8 and 9**) and located at the southwest corner of King Road and Cooper Loop. The building has a roughly rectangular footprint, a flat roof with shallow parapets, concrete walls, and a concrete foundation. The building's massing is complex with a central hangar and office additions. The original portions of the building are designed in simplified Art Deco style with unpainted, cast-in-place concrete exterior walls and paired, steel sash windows stacked vertically in bays, which are recessed from the wall planes in a series of shallow setbacks. The parapets have a shallow setback at the top. The primary entrance is centered in the east elevation and projects slightly. The top of the entrance has a shallow, curved pediment, which steps down to the parapet line. The northwest corner of the building features cast concrete panels, which mimic window frames and mullions. An addition was constructed on the east side of the south elevation of cast-in-place concrete exterior walls with horizontal and vertical score lines, two rows of banded windows and exposed aggregate finish and ceramic tile surrounding the entrance. At the south elevation of this addition is an entrance marked by a ceramic tile surround and concrete overhang. The building's Streamline Moderne features include its concrete construction, emphasis on the horizontal through the use of banding and scoring, decorative piers flanking hangar doors, multi-light hangar doors with solid metal panel bases and inset personnel doors, shaped parapets, and industrial windows (singles and pairs). The building has undergone some alterations including a U-shaped Contemporary office addition built in 1960 around the southern end of building. A section of rooftop fixed guardrails on the south end of the west side of the building would be removed and replaced as part of the proposed project (**Photograph 8**).



**Photograph 8. South side and eastern-facing façade of Building N210.
The 1960-constructed addition is on the left, view to northwest.**



Photograph 9. North and west sides of Building N210, view to southeast.

5.3 Building N230

Constructed in 1960 as the Physical Science Research Lab, Building N230 is approximately 250 feet west of the intersection of Boyd Road and Mark Avenue. The two-story Contemporary-style laboratory and office building has a rectangular footprint, symmetrical façade, reinforced concrete walls, and a flat roof (**Photograph 10**). The concrete exterior walls of the southern-facing façade are scored in a grid pattern. Each story on the façade features a series of continuous aluminum-framed windows shaded by projecting, flat, concrete awnings. The windows are mostly fixed with some hopper or awning units. The centrally located primary entrance on the facade includes a recessed pair of glazed doors with a transom and a projecting concrete awning above, flanked by full height, vertically scored concrete pilasters. The east and west sides lack windows but have overhead and personnel entries on the first floor. The south side has two entries on the first floor, and two utility access doors and four louvered vents line the second story (**Photograph 11**). This study assumes Building N230 is eligible for the purpose of this project. Formal evaluation of this building is currently being conducted under a separate scope of work for an architectural survey of the NASA Ames Campus.

5.4 Arc Jet Complex

The Arc Jet Complex includes Buildings N234, N238, and the SVS. The complex was listed in the NRHP in 2017 because it is significant at the national level for its contributions in the areas of science and engineering. It is listed under Criterion A for its association with advancements in arc jet technology and research and development of Thermal Protection Systems (TPS) for NASA's spaceflight programs, including the exceptional role of the 60-MW Interaction Heating Facility arc jet in developing and refining TPS for the SSP. The complex is also listed under Criterion C for its design and engineering, which allowed for significant innovations in arc jet technology. The period of significance is 1962 to 2011; from the year Building N-234 and the SVS were constructed to the end of the SSP. The property is also listed under Criteria Consideration G as a property that has achieved significance within the past 50 years in relation to its exceptional significance within the context of the SSP.



Photograph 10. East and south sides of Building N230, view to northwest.



Photograph 11. West and south sides of Building N230, view to southeast.

5.4.1 Building N234

Constructed in 1962, Building N234 and its related SVS equipment were built as the Gasdynamics Laboratory and were used for research in heat shield applications and aerodynamics for spacecraft re-entry into Earth's atmosphere. The Contemporary-style two-story laboratory and office building has a concrete foundation, an asymmetrical plan, reinforced concrete walls, and a flat roof (**Photograph 12**). The building is composed of two distinct parts – an office portion on the façade (south), and a laboratory portion on the rear (north). The southern-facing façade has concrete walls that are scored in a grid pattern. Each story on the façade and east elevation features a series of continuous aluminum-framed windows shaded by projecting, flat concrete awnings. The windows are mostly fixed with some hopper or awning units. The offset central entrance includes a recessed pair of glazed doors with a transom and a cantilevered concrete awning above, flanked by full-height brick pilasters. The west elevation contains no fenestration and has an attached brick partition wall enclosing the area around it.

The rear elevation is clad with corrugated metal siding and has an L-shaped plan. Its east side contains a single glazed door and a roll-up steel utility door in the first story, and an exterior staircase leading to a single glazed door in the second story. The rear of the building is connected to SVS equipment.



Photograph 12. South and east sides of Building N234 with SVS in background on right, view to northwest.

5.4.2 SVS

The SVS is composed of large-scale industrial-grade metal tubing, valves, structural supports, and tanks (**Photograph 13**). The SVS was first built as part of Building N-234 in 1962 and was later expanded to connect to Building N-238. It is integral to the operation of the Arc Jet Complex. The SVS is currently powered by a boiler located in a separate building (Building N234A) and operates with the Cooling Towers adjacent to the SVS to the east (**Photograph 14**). The connected Cooling Towers consist of five aligned cylindrical towers with vents housed in a rectangular, two-story structure that is clad in corrugated metal and vented in the first story.

5.4.3 Building N238

Building N238 was built in 1964 as the Arc Jet Lab and has a utilitarian design composed of two distinct sections: a one-story L-shaped portion with brick exterior walls, and a corrugated metal structure 1.5 stories high situated within the ell of the brick portion and extending to the south and west (**Photograph 15**). The building has a 17,030-square-foot rectangular plan with a concrete foundation, a steel-frame structural system, and a flat roof. The northern-facing of the brick portion contains two windows in the eastern portion and an entrance with glazed double-doors in the western portion. The east side of the brick portion extends the full width of the building and contains a steel overhead utility door. The west side of the brick portion and the north side of the corrugated metal portion have no fenestration. The west side of the corrugated metal portion contains a steel overhead utility door and a single man-door (**Photograph 16**). The rear (south side) is connected to the SVS.

5.5 Building N239

Building N239 was constructed in 1965 as the Astrobiology & Life Science Laboratory. The Brutalist-style building is three stories tall with a flat roof and central rooftop mechanical penthouse and has an irregular, but symmetrical footprint (**Photograph 17**). The concrete exterior features smooth base, frieze, corners and scored panels with raised, textured concrete panels that resemble the surface of the moon. Three rows of small, recessed, fixed windows punctuate the north and south sides and a row of four similar windows on the first story on the east and west sides. At each of the corners are recessed, metal frame, glass stairwells (**Photograph 18**; see Photograph 17).



Photograph 13. SWS, southwest side of the Arc Jet Complex, view to northeast.



Photograph 14. Cooling towers east of SWS, view to northwest.



Photograph 15. North and east sides of Building N238, view to southwest.



Photograph 16. North and west sides of Building N238, view to southeast.

Primary entry into the building is centrally located on the west side and is accessed by curved concrete stairs and railings (**Photograph 19**). The recessed pair of glazed aluminum doors has fixed sidelights and a transom. Above the entry are three cantilevered plain concrete balconies. The secondary entry is on the south end of the east side and consists of a pair of glazed aluminum doors with a fixed transom. This entry is accessed by an ADA-complaint ramp that connects to Building 239A. This study assumes Building N239 is eligible for the purpose of this project. Formal evaluation of this building is currently being conducted under a separate scope of work for an architectural survey of the NASA Ames Campus.



Photograph 17. South and east sides of Building N239 taken from roof of building N239A, view facing northwest.



Photograph 18. South side of Building N239, view facing north.



Photograph 19. Primary entry on west side of Building N239, view facing east.

5.6 Building N239A

Building N239A was constructed as the Life Science Laboratory High Bay / 50' Diameter Low-G Simulator 1 in 1966. Buildings N239 and N239A share a parking lot (**Photograph 20**). The two-story concrete building has a long, rectangular footprint and a flat roof. Narrow concrete pilasters punctuate the smooth concrete wall panels and extend slightly above the roofline. Primary entry into the building is through two-story metal external staircase on the south ends of the east and west sides (**Photograph 21**; see Photograph 20). The building lacks windows but has several personnel and overhead doors on the north and west sides (**Photograph 22**; see Photograph 21). This study assumes Building N239A is eligible for the purposes of this project. Formal evaluation of this building is currently being conducted under a separate scope of work for an architectural survey of the NASA Ames Campus.

6. Assessment of Effects

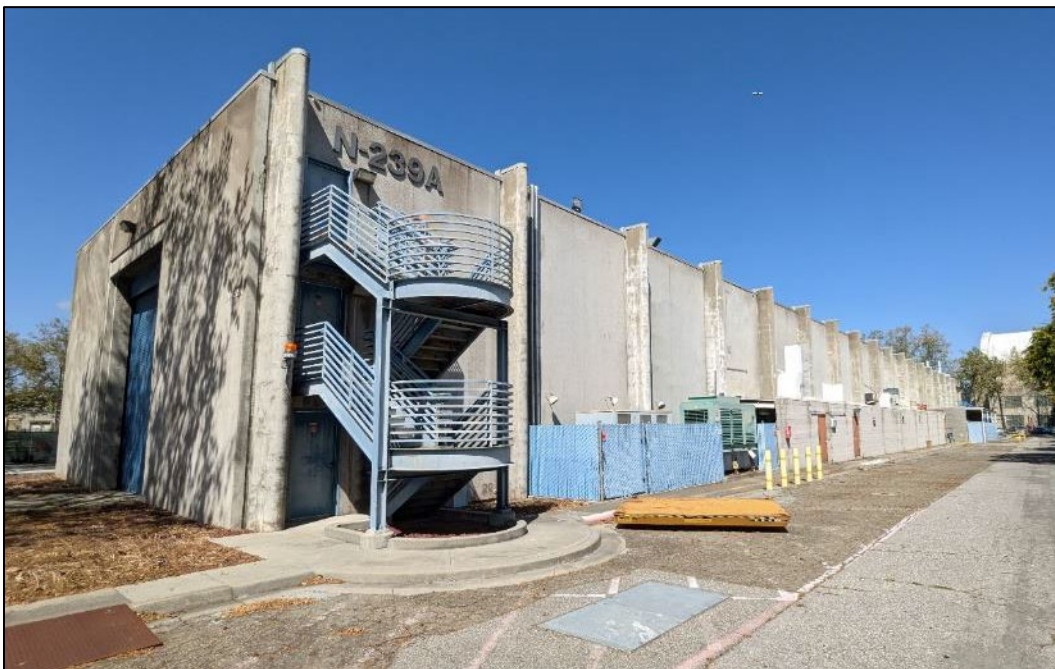
The Criteria of Adverse Effect pursuant to 36 CFR 800.5(a)(1) are applied to assess effects of the undertaking on historic properties within the APE:

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 NRHP 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 NRHP. 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.

Several examples of adverse effects are listed in 36 C.F.R. 800.5(a)(2). The following assessment examines the undertaking under each of those examples, including an analysis of compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties (Standards).



Photograph 20. West side of Building N239A in background, southeast corner of Building N239 on left, proposed location of EV charging stations near red car at right, view facing east.



Photograph 21. South and east sides of Building N239A, view facing northwest.



Photograph 22. North and west sides of Building N239A, view facing southeast.

(i) Physical destruction of or damage to all or part of the property

The installation of the new fixed guardrails would require the drilling of holes on the back of the roof parapets of Buildings N203, N210, N215, N220, N230, and N260. However, this does not constitute physical destruction and would only cause minimal damage to existing materials. Installation of the non-permanent ballasted railing system on Buildings N238 and N239 would not result in any physical destruction or damage to the buildings.

(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 C.F.R. part 68) and applicable guidelines

With the SHPO's agreement, if a property is restored, rehabilitated, repaired, maintained, stabilized, remediated, or otherwise changed in accordance with the Standards, then it will not be considered an adverse effect. The following is an assessment of the undertaking for compliance with the Standards and guidelines (NPS 2017).

1. *A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces and spatial relationships.*

The use of all the buildings included in the proposed project and the districts would not change from the installation of rooftop fall protection guardrails.

2. *The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided.*

Installation of the rooftop fall protection guardrail systems would not alter any of the identified or inferred character-defining features of the historic properties through removal or alteration. While the area along the rooflines would be modified with the installation of the guardrail systems, the maximum visibility of the metal railings would be 38" above the top of the extant roofline parapets. The 19" gaps between the top rail and midrail in the guardrail systems would minimize the visual intrusion of the life-safety guardrail, as opposed to a solid railing system, and the proposed guardrails would not change the massing, space or spatial relationships of the buildings or adjacent buildings, or the NASA Wind Tunnel

Historic District or the proposed NACA District. Overall, the historic character of the buildings and the districts would be retained and preserved.

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 historic properties, will not be undertaken.*

No conjectural features would be added to the buildings. The fixed guardrails and the non-permanent ballasted railing system would not create a false sense of historical development on the historic buildings or within the districts.

4. *Changes to a property that have acquired historic significance in their own right will be retained and preserved.*

The only substantial alteration of any of the buildings in the APE is the 1960 U-shaped Contemporary addition on the southern end of Building N210 that also has the only extant section of rooftop fixed guardrails (see **Photograph 8**). There is no indication that the addition, or the rooftop fixed guardrails that would be removed have acquired significance in their own right. Other material changes within the districts that are significant (not identified in this study) would not be affected by this project.

5. *Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.*

None of the distinctive materials, features, or finishes on the building exteriors or within the districts would be removed or replaced as part of the proposed project.

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

The project does not propose any work on deteriorated historic features.

7. *Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.*

The project does not propose any chemical treatments.

8. *Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.*

The project does not propose any work that could compromise archaeological resources.

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

Installation of the rooftop fall protection guardrail systems would not destroy any of the identified or inferred character-defining features of the architectural resources through removal or alteration. As described under Standard 2, while the area along the rooflines would be modified with the installation of the guardrail systems, the maximum visibility of the metal railings would be 38" above the top of the extant roofline parapets. The 19" gaps between the top rail and midrail in the guardrail systems minimize the visual intrusion of the life-safety guardrail, as opposed to a solid railing system, and the proposed guardrails would not change the massing or spatial relationships of the buildings, adjacent buildings, or the NASA Ames Wind Tunnel Historic District to the proposed NACA District.

10. *New additions and adjacent or related new construction will 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.*

The installation and removal of the non-permanent ballasted railing system on Buildings N238 and N239 that uses weighted bases instead of mounting plates would leave the buildings unimpaired. Removal of the fixed guardrails that would be attached to the inside of the roof parapets at Buildings N203, N210, N215, N220, N230, and N260 would result in holes left in the rear of the roof parapets that could be repaired to match the extant material and appearance.

(iii) Removal of the property from its historic location

None of the building within the project APE will be relocated.

(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

The use of all the buildings included in proposed project would not change from the installation of rooftop fall protection guardrails, and the setting of all the buildings and the NASA Ames Wind Tunnel Historic District and the proposed NACA District would remain the same.

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

No visual, atmospheric, or audible elements would be introduced by this project that would diminish the integrity of the historic properties in the APE, as described above under Standard 9. Introduction of the rooftop fall protection guardrail systems would not diminish the integrity of the historic properties in the APE, including the NASA Ames Wind Tunnel Historic District and the proposed NACA District, to an extent that they can no longer convey their historic significance.

(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

This standard is not applicable.

(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

This standard is not applicable.

7. Summary of Findings

The Criteria of Adverse Effect were applied to assess the undertaking's potential effects on the historic properties in the APE, including Buildings N203, N210, N215, N220, N230, and N239, the Arc Jet Complex, and the NASA Ames Wind Tunnel Historic District or the proposed NACA District. This assessment of effects found that the installation of the proposed fall protection guardrails is consistent with the Standards, and the proposed project would not result in an adverse effect on historic properties. No below-grade activities are proposed for this project, and archaeological resources would not be affected. Therefore, the proposed undertaking would have no adverse effects on historic properties per 36 CFR § 800.5(b) and a finding of No Adverse Effect is recommended.

8. References

AECOM. 2014. *Integrated Cultural Resources Management Plan for NASA Ames Research Center, Moffett Field, California*. Accessible online at https://historicproperties.arc.nasa.gov/downloads/icrmp_nasa_arc_all.pdf.

_____. 2016a. *National Register Nomination for the Arc Jet Complex*. Accessible online at https://historicproperties.arc.nasa.gov/downloads/summary/nrhp_arcjet_20161101.pdf.

_____, 2016b. *National Register Nomination for the NASA Ames Wind Tunnel Historic District*. Accessible online at https://historicproperties.arc.nasa.gov/downloads/summary/nrhp_windtunneldist_20161101.pdf.

_____. 2022. *Section 106 Consultation on Building N204A Window Replacement Project, NASA Ames Research Center, Moffett Field, Santa Clara County, California (NASA_2021_0525_001)*.

Kleinfelder.2021. *Section 106 Technical Memorandum for the Moffett Field Site 28 Vapor Intrusion Project*. On file at ARC.

Page & Turnbull, 2007. *Evaluation of Historic Resources Associated with the Space Shuttle Program at Ames Research Center*. Accessible online at https://historicproperties.arc.nasa.gov/downloads/shuttle_2_assessment.pdf

Appendices

- A. Figures
- B. Select Project Drawings
- C. Accu-Fit Safety Railing Product Data Sheet

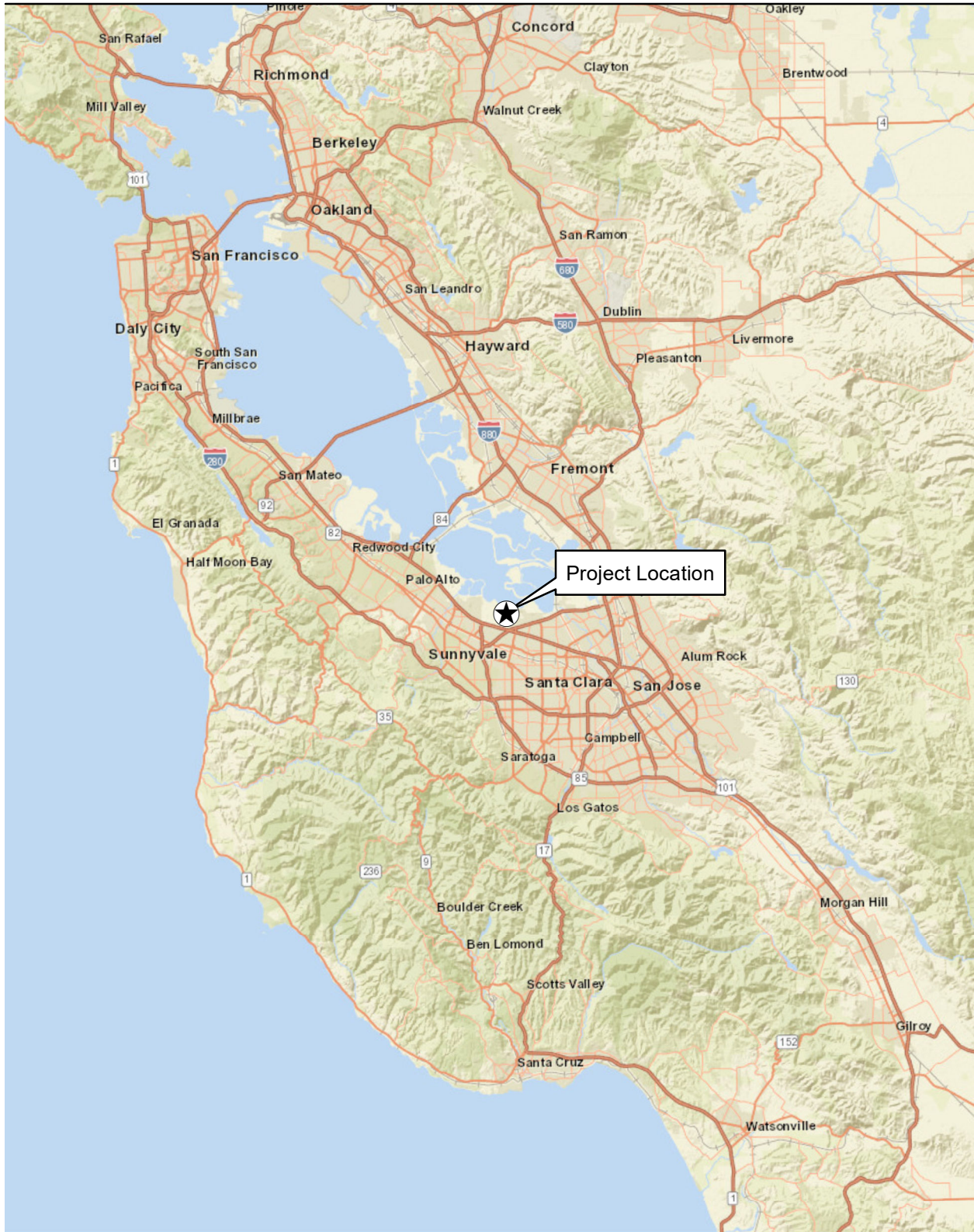
Appendix A

Figures

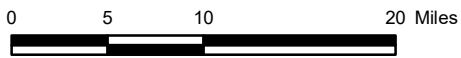
Figure 1 – Project Location

Figure 2 – Project Site

Figure 3 – APE



Source: ESRI, AECOM, NASA

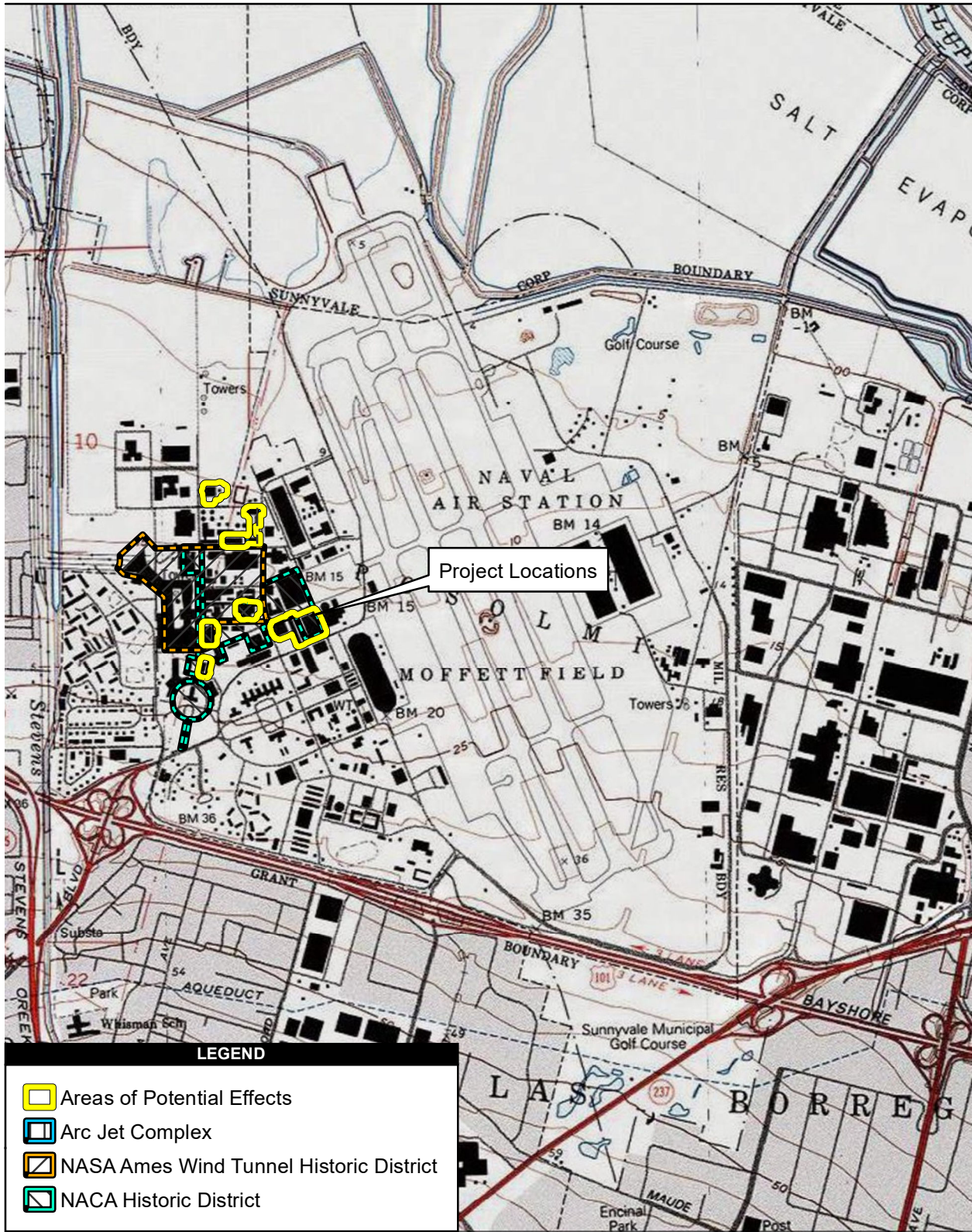


Scale: 1 = 633,600; 1 inch = 10 mile(s)

Figure 1
Project Location

NASA Fall Protection Project

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Source: ESRI, AECOM, NASA, National Geographic Society; USGS 7.5' Topographic Quadrangle: Mountain View

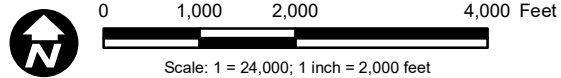
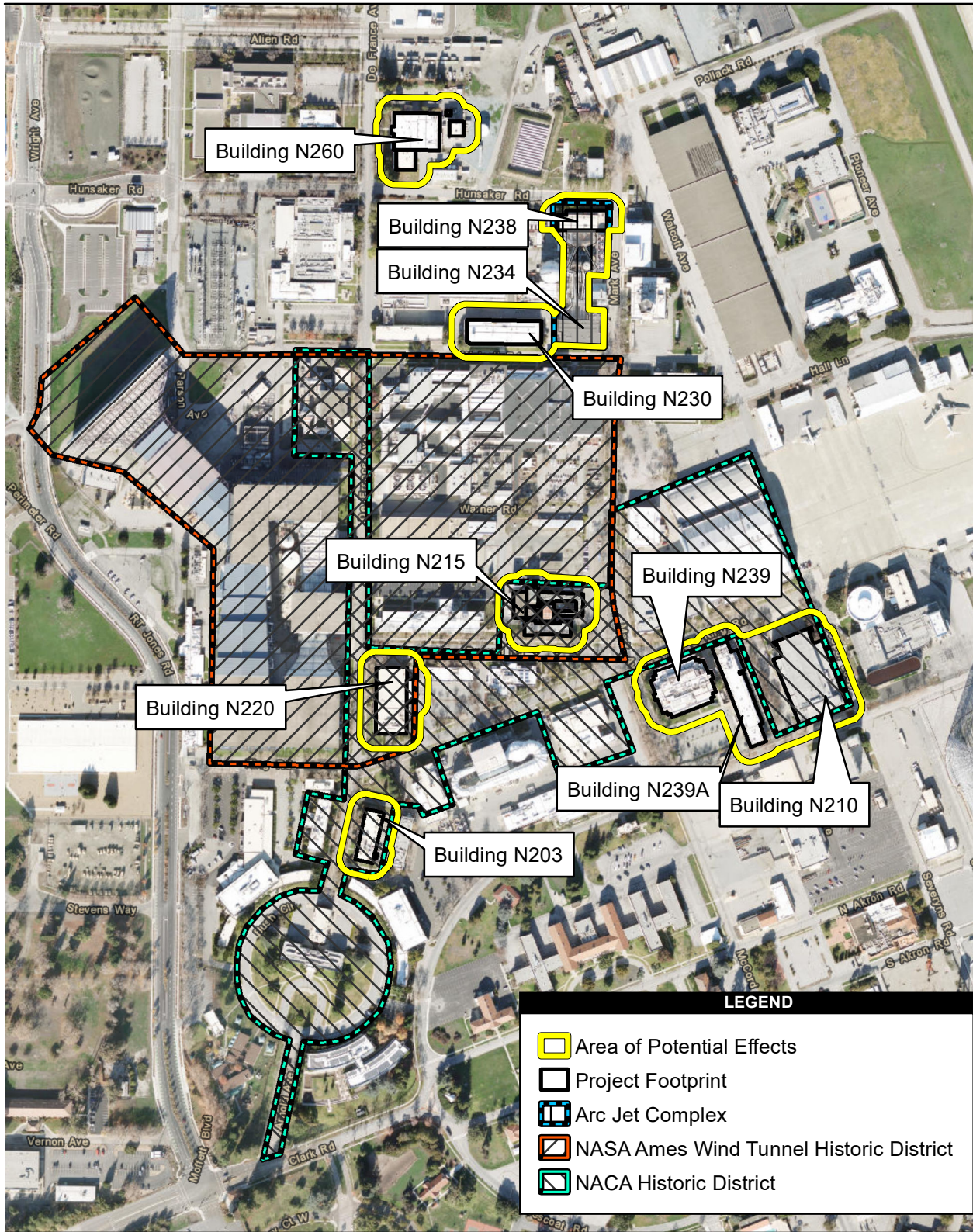


Figure 2
Project Site

NASA Fall Protection Project

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Source: ESRI, AECOM, NASA

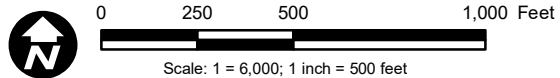
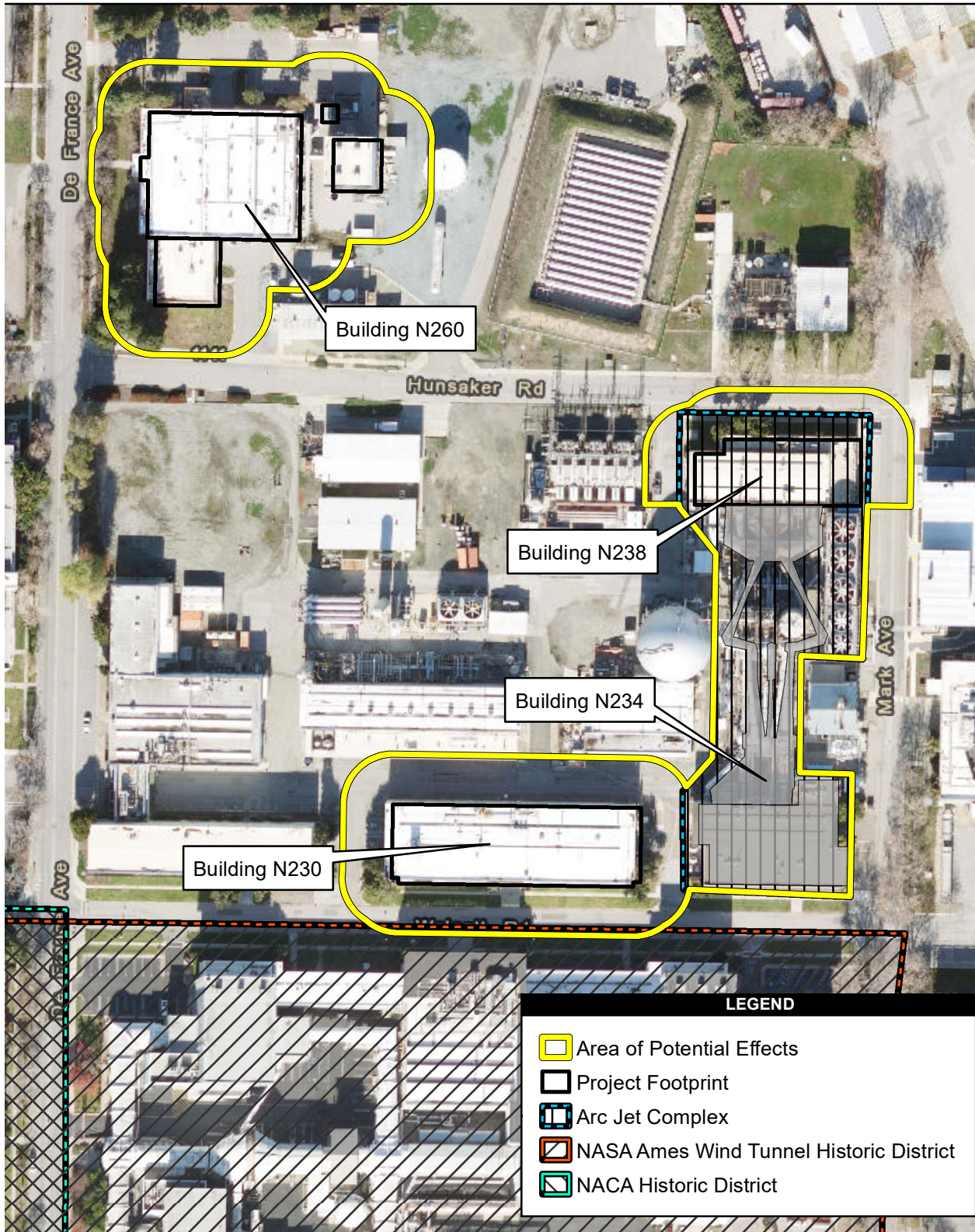


Figure 3
APE Map

NASA Fall Protection Project

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Source: ESRI, AECOM, NASA

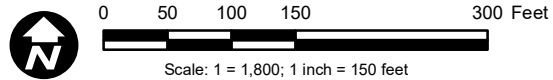
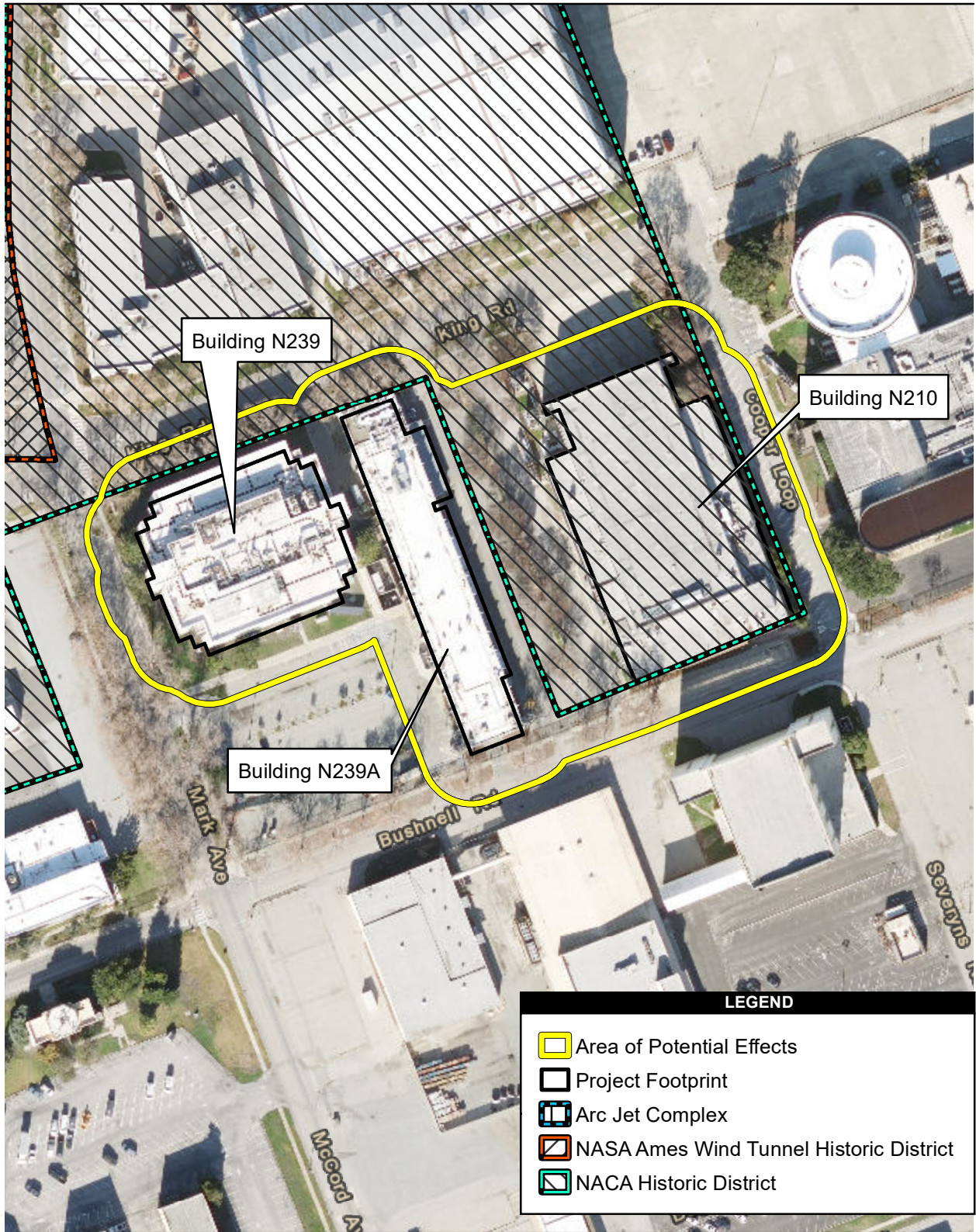


Figure 3A
APE Map

NASA Fall Protection Project

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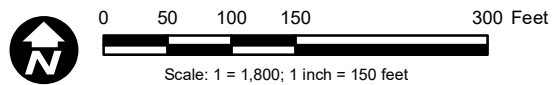
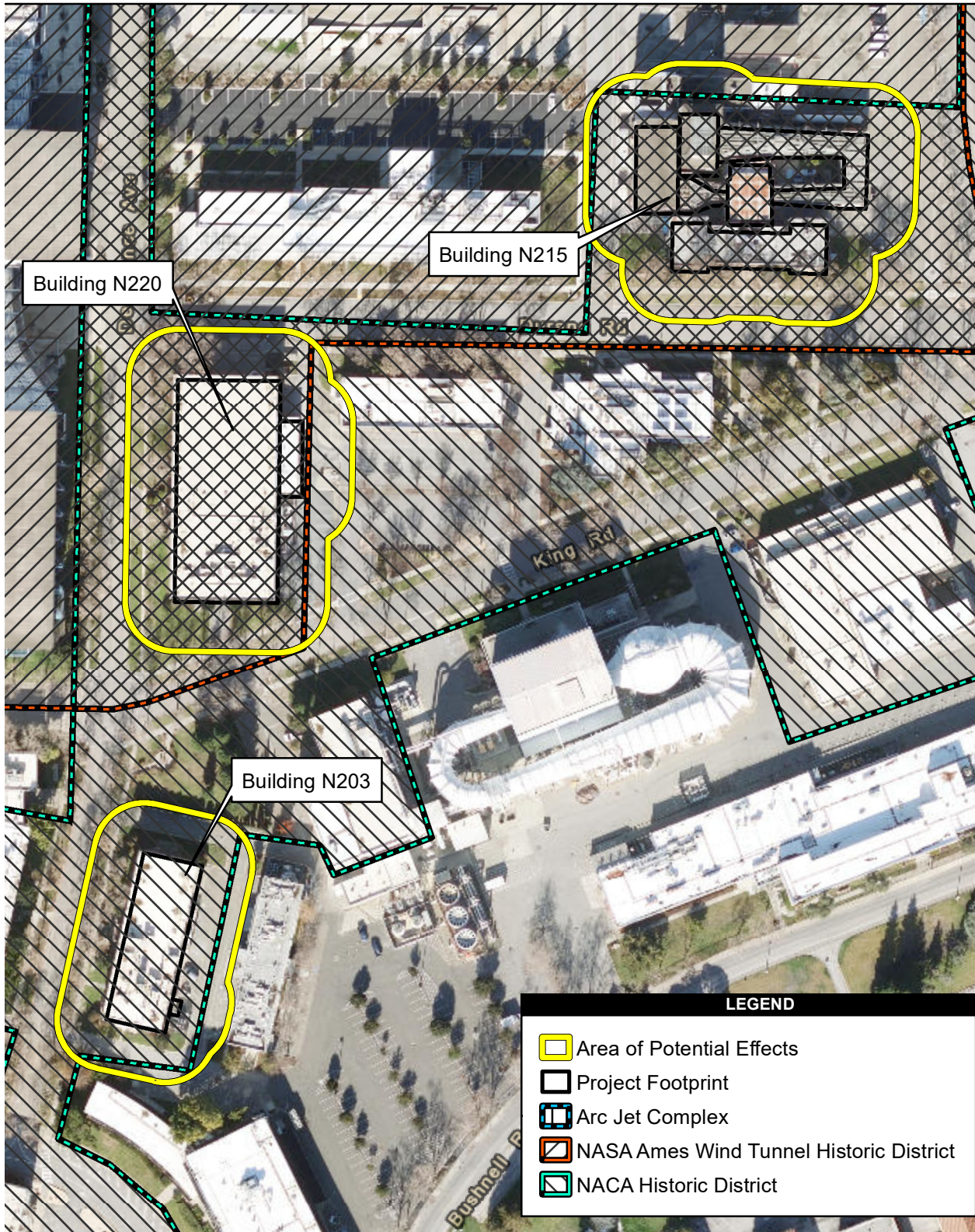


Figure 3B
APE Map

NASA Fall Protection Project

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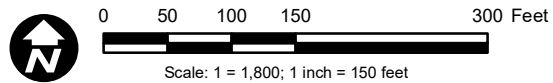


Figure 3C
APE Map

NASA Fall Protection Project

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The following content was redacted from this public posting:

Appendix B. Select Project Drawings
Appendix C. Accu-Fit Safety Railing Product Data Sheet