

**DESERT RESEARCH INSTITUTE
CULTURAL RESOURCES REPORT SR040623-1
PROJECT NO. 236023**

**EVALUATION OF BUILDING 23-702,
LOS ALAMOS SCIENTIFIC LABORATORY H-8 FOIL HANDLING BUILDING,
MERCURY, AREA 23, NEVADA NATIONAL SECURITY SITE,
NYE COUNTY, NEVADA**



Prepared by

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June 2023

Cover Photograph: Building 23-702, facing south, taken on September 7, 1967 (REECo frame 2539-7).

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Prepared for

**U.S. Department of Energy
National Nuclear Security Administration
Nevada Field Office, Las Vegas, Nevada**

Submitted by

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June 2023

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EXECUTIVE SUMMARY

The U.S. Department of Energy (DOE) National Nuclear Security Administration Nevada Field Office (NNSA/NFO) plans to demolish Building 23-702, the Los Alamos Scientific Laboratory (LASL) H-8 Foil Handling Building (Nevada State Historic Preservation Office [SHPO] Resource No. B15278) at the Nevada National Security Site (NNSS) in Nye County, Nevada. The NNSA/NFO is implementing a long-term project to modernize the town of Mercury for future mission needs. The project is considered an undertaking subject to review under Title 54 of United States Code (USC) § 306108, commonly known as Section 106 of the National Historic Preservation Act, Title 54 USC § 300101, et seq., and its implementing regulations, Title 36 of the Code of Federal Regulations (36 CFR) Part 800.

In 2018, Desert Research Institute (DRI) completed an architectural survey of the town of Mercury. This effort resulted in the identification, recordation, and evaluation of the Mercury Historic District (MHD, SHPO Resource No. D230), including the identification of its contributing elements (Reno et al. 2018). The MHD was recommended eligible for listing in the National Register of Historic Places (NRHP, National Register) under the Secretary of the Interior's (SOI) Significance Criteria A and C, as defined in 36 CFR Part 60.4, as a significant concentration of buildings and structures with a direct and important association with Cold War-era nuclear testing from 1951 through 1992.

As part of the modernization program for Mercury, the NNSA/NFO and the SHPO executed the 2018 *Programmatic Agreement Between the National Nuclear Security Administration Nevada Field Office and the Nevada State Historic Preservation Officer Regarding Modernization and Operational Maintenance of the Nevada National Security Site, at Mercury in Nye County, Nevada* (Mercury PA). The Mercury PA includes streamlined Section 106 procedures for undertakings in the MHD based on contributing element categories. Building 23-702 is identified in Appendix C of the Mercury PA as a Category I contributing element, indicating that it might be individually eligible for the NRHP. It is a historic property for the purposes of Section 106 compliance and subject to the stipulations of the Mercury PA.

Per Stipulation VI of the Mercury PA, when the Area of Potential Effect (APE) for an undertaking includes Category I elements, the NNSA/NFO must evaluate the Category I elements for individual NRHP eligibility under all of the SOI Significance Criteria prior to initiating any activity that may affect the elements. The purpose of this report is to evaluate Building 23-702 as a potential individually eligible historic property in fulfillment of Stipulation VI of the Mercury PA. The evaluation detailed herein concludes that Building 23-702 is not individually eligible for listing in the NRHP. Although it retains aspects of integrity and continues to contribute to the MHD, it is not individually significant under any of the SOI Significance Criteria.

ACKNOWLEDGEMENTS

Martha DeMarre, Archivist at DRI, contributed to the historical research. Megan Stueve, Archaeologist, assisted with fieldwork and photography. The historic context sections herein include revised versions of earlier work by Ron Reno, Architectural Historian and Archaeologist; Maureen King, Archaeologist; Laura O'Neill, Architectural Historian; and Nicole Brannan, Architectural Historian, at DRI.

Patricia Gallo, National Environmental Policy Act Compliance Officer for the NNSA/NFO, served as the program manager overseeing this project. Alissa Silvas and Brett Guinan of Mission Support and Test Services, Inc. (MSTS) arranged for access to the subject building to complete fieldwork and photography.

Qualifications for the preparers of this report are provided in the Preparers' Qualifications section at the end of the document.

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I. INTRODUCTION

The U.S. Department of Energy (DOE) National Nuclear Security Administration Nevada Field Office (NNSA/NFO) proposes to demolish Building 23-702, the Los Alamos Scientific Laboratory (LASL) H-8 Foil Handling Building, at the Nevada National Security Site (NNSS) in Nye County, Nevada (see Figure 1 and Figure 2) in support of their long-term project to modernize the town of Mercury. The building is a Category I contributing element to the Mercury Historic District (MHD), as defined in the *Programmatic Agreement Between the National Nuclear Security Administration Nevada Field Office and the Nevada State Historic Preservation Officer Regarding Modernization and Operational Maintenance of the Nevada National Security Site, at Mercury in Nye County, Nevada* (hereafter the Mercury PA) and Appendix C of the Mercury PA. Accordingly, Building 23-702 is considered a historic property for the purposes of Section 106 of the National Historic Preservation Act (NHPA).

Per Stipulation VI of the Mercury PA, when the Area of Potential Effect (APE) for an undertaking includes Category I elements, the NNSA/NFO must evaluate the Category I elements for individual National Register of Historic Places (NRHP) eligibility. The purpose of this report is to evaluate Building 23-702 for potential individual NRHP eligibility in fulfillment of Stipulation VI.



Figure 1. Project location in Mercury, Nevada National Security Site (NNSA/NFO 2017).

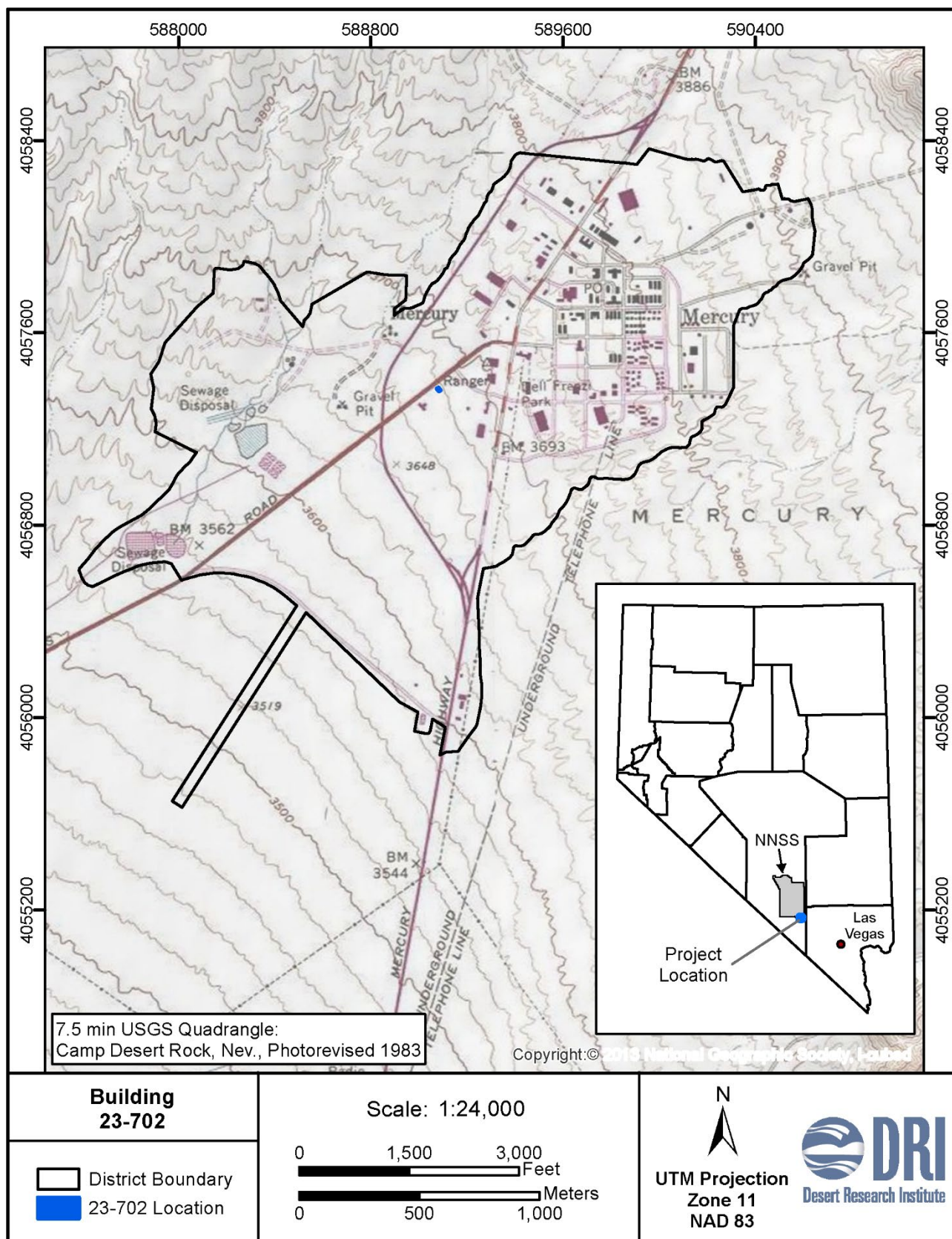


Figure 2. Project location within the MHD boundary.

II. RESEARCH DESIGN

Objectives

The purpose of this architectural resource evaluation is to comply with the requirements of Section 106 of the NHPA of 1966, as amended, for the NNSA/NFO to manage historic properties under its jurisdiction. Specifically, this report complies with the Mercury PA.

Area of Potential Effect

The NNSA/NFO delineated the APE using the metrics of Stipulation II of the Mercury PA. For direct effects (such as physical demolition and equipment staging), the APE includes the footprint of Building 23-702 and a 25-foot-wide perimeter around the footprint (Figure 3). For indirect effects (such as visual, atmospheric, and audible effects), the boundary of the MHD is used per Stipulation II.B (see Figure 2). For cumulative effects and new construction (Stipulations II.C and II.D), the APE is the same as for indirect effects.

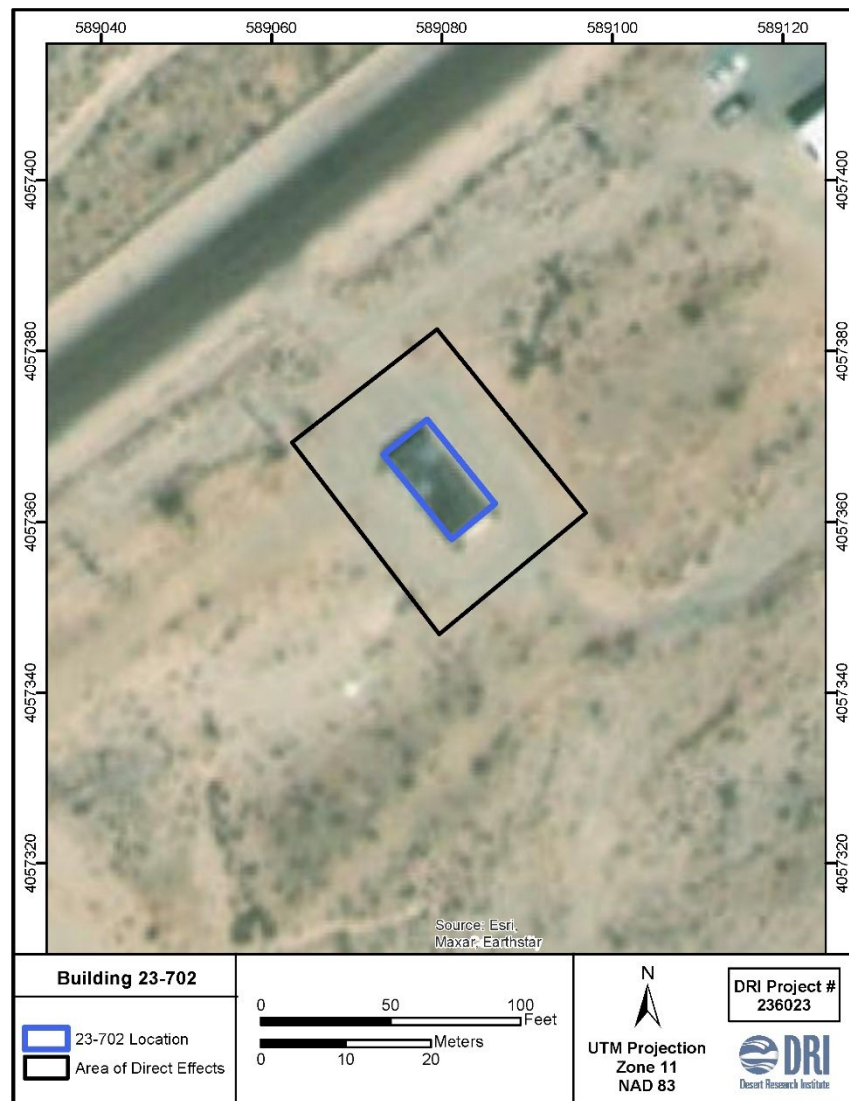


Figure 3. Direct effects area for the undertaking.

Element Category Identification

The Mercury PA identifies Building 23-702 as a Category I property. Category I properties are those that may be unique to the MHD or have only one representative in the MHD and might be individually eligible for listing in the NRHP. Building 23-702 was the only building in Mercury constructed with this design, and therefore it was considered a Category I property in the district architectural survey (Reno et al. 2018).

Methods

Research, fieldwork, updates to the original Nevada Architectural Resource Assessment (ARA) form for Building 23-702, and this report were designed to meet the requirements of Mercury PA Stipulation VI for evaluating the Category I element within the project APE.

Buildings and major structures are identified on the NNSS by numbers or letters with their area number in the prefix. For example, the LASL H-8 Foil Handling Building is identified as 23-702 because it is located in Area 23. The prefix is followed by a unique identifying number or combination of letters and numbers ("702" for the subject resource). NNSS identifiers are used throughout this report because they are tied to the existing archival documentation and source materials for the NNSS extending back through the entire Cold War period.

Building 23-702 was initially surveyed and recorded on an ARA form as part of *The Architecture of Mercury – Nevada's Atomic Boom Town: An Architectural Survey of Mercury, Area 23, Nevada National Security Site, Nye County, Nevada* (Reno et al. 2018). The ARA form evaluated Building 23-702 as a potential contributing element to the MHD, not as a potential individual historic property. Therefore, research at the time was restricted to what was necessary to determine whether or not Building 23-702 contributed to the historic district. Additional research conducted for this report to properly evaluate Building 23-702 as a potential individual historic property included reviewing engineering records, historical maps, and photographs; searching newspaper archives; revisiting DOE documents related to the history and development of the NNSS; and reviewing scholarly books and articles about the NNSS and related contexts and themes. Dates of original construction and alterations recorded on the original ARA form were confirmed and updated based on primary sources, including architectural and engineering drawings, newspaper articles, DOE documents, and dated photographs.

Tatianna Menocal, Nicole Brannan, and Megan Stueve conducted fieldwork on April 6, 2023, to update the previous description of Building 23-702 and to document the interior, which had not been included in the MHD survey. Ms. Brannan took the digital photographs and Tatianna Menocal and Megan Stueve assisted with notetaking and the photography log.

Following the research and fieldwork tasks, appropriate historic contexts were compiled to facilitate a detailed NRHP evaluation of Building 23-702 as a potential individual historic property. The property was evaluated within the identified historic contexts using the Secretary of the Interior's (SOI) Significance Criteria. The physical integrity of the property was also analyzed in terms of the seven aspects defined in 36 CFR Part 60.4. *National Register Bulletin #15: How to Apply the National Register Criteria for Evaluation* (NPS 1997) was referenced to complete the significance evaluation and integrity analysis.

The results of the additional research and NRHP evaluation of Building 23-702 completed for the current undertaking are provided in this report. The ARA form for the building will be updated as part of mitigation for the undertaking in accordance with the Mercury PA following consultation with

the Nevada State Historic Preservation Office (SHPO) on the findings in this individual NRHP evaluation report.

III. HISTORIC CONTEXT

The following historic context presents contexts and themes related to Building 23-702 for the purpose of evaluating the property for individual NRHP eligibility. The main context identified as relevant to the evaluation and necessary for understanding the extant property is Nuclear Testing on the NNSS. The relevant theme is the work of the LASL on the NNSS, particularly the Health Division H-8 group. Information pertaining to the architect and builder of Building 23-702 is also provided to support the evaluation of the building under NRHP Significance Criterion C. Broader contexts and themes related to the MHD and nuclear testing during the Cold War period are detailed in *Architecture of Mercury* (Reno et al. 2018) and the *Draft Cultural Resource Management Plan for the Nevada National Security Site, Nye County, Nevada* (Rhode et al. 2020), respectively, and are not discussed at length herein.

Natural Setting

Building 23-702 is located in the town of Mercury on Jackass Flats Road, approximately four miles from U.S. Route 95. Mercury is located on a southwest-facing bajada below the Spotted Range in the northeast corner of Mercury Valley. The center of Mercury is at an elevation of approximately 3,700 feet. Red Mountain towers over Mercury to the north and the valley is bounded by the Specter Range to the southwest. The Spring Mountains lie to the south. To the northeast is Mercury Ridge, which separates Mercury from Frenchman Flat further to the northeast.

Nuclear Testing on the NNSS

The text for this section was compiled using existing historic contexts presented in *Architecture of Mercury* (Reno et al. 2018) and *Draft Cultural Resource Management Plan* (Rhode et al. 2020). Relevant text from each document was excerpted, compiled, and adapted to suit the purposes of this report with references to Building 23-702 added as appropriate.

The continental nuclear test site, now known as the NNSS, has gone through several name changes over time, from South Site, Alternate Test Site B, Site Mercury, and Nevada Test Site (NTS) from 1951-52 to Nevada Proving Ground from 1952-1954 and back to NTS in January 1955 (AEC 1952). Its name remained NTS for the rest of the Cold War. The facility was renamed in 2010 and is currently managed as the NNSS.

Nuclear testing has been a major and important part of the history of Nevada and the United States (Tlachac 1991a, 1991b). Much of this activity revolved around the NNSS, where most of the developments and experiments in nuclear weapons were tested both above- and belowground. The consequences of these activities have been felt worldwide, played a vital role in the national defense of our country, and helped shape world politics.

Beginning in the late 1940s, prior to establishing the NNSS, both low- and high-yield nuclear tests were conducted at the Pacific Proving Grounds in the vicinity of the Marshall Islands. Transporting personnel and equipment back and forth between the test area and the scientific laboratories was expensive and time-consuming. The Armed Forces Special Weapons Project conducted a top-secret feasibility study named Project Nutmeg to find a suitable nuclear test site in the continental United States (Fehner and Gosling 2000:36). The Korean War, which began in 1950, escalated security concerns at the Pacific Proving Grounds providing further motivation for the continental search (DTRA 2002:77; Friesen 1995:4).

The ideal continental test site would have favorable and predictable weather and terrain conditions for year-round testing, the land would be under federal control, and it would have an infrastructure already in place (Lay 1950; Tlachac 1991a). Other important factors included security, remoteness from populated areas, and relative proximity to the scientific laboratories in New Mexico. The Las Vegas Bombing and Gunnery Range in southern Nevada was selected as the place that best met these criteria (Fehner and Gosling 2006:43). The range also had large, flat terrain to conduct tests, westerly prevailing winds away from the densely populated West Coast, and natural topographic barriers to screen the test areas from public viewing. Based on the recommendations of the LASL (which later became the Los Alamos National Laboratory [LANL] in 1980) the Atomic Energy Commission (AEC) and the National Security Council, President Truman approved the new test site location on December 18, 1950.

McKee Construction Company and Reynolds Electrical & Engineering Company (REECo) were hired to begin preparing for the first tests, focusing most of their work on the ground zero area in Frenchman Flat (Campbell et al. 1983:174; Fehner and Gosling 2000:51, 64). Both companies worked as construction contractors at the LASL in New Mexico and were familiar with the proposed tasks. The Ranger nuclear test series in Frenchman Flat began on January 27, 1951, with the Able test and ended with the Fox test on February 6, 1951 (Fehner and Gosling 2000:70, 75; NNSA/NFO 2015; Ogle 1985:43-44; Titus 1986:58). As a safety measure, the primary testing area was moved north from Frenchman Flat to Yucca Flat for the next series of tests in the fall of 1951.

The town of Mercury quickly became the administrative and residential hub of the NNSS in the 1950s. Initially named Base Camp Mercury, it was planned to provide minimum facilities for two or three test series a year, with a six-week time frame for each series. Holmes & Narver and Silas Mason Company—two prominent government contractors during the Cold War—shared in the design of Mercury, which initially included barracks, a mess hall, and administrative buildings. The camp was designed to accommodate 412 people at peak periods of use for only 18 weeks a year. By late 1951, these expectations were already obsolete because the camp overflowed with 1,100 residents (Fehner and Gosling 2000:81).

In response, a \$6.7 million construction project was approved to meet the needs of the growing testing program and population in Mercury (NNSA/NFO 2013). The AEC expanded the base camp, adding more barracks, a second mess hall, a recreational facility, a warehouse, offices, and laboratory space (Fehner and Gosling 2000).

In 1958, both the United States and the former Soviet Union ceased nuclear testing by self-imposed moratoria at the urging of internal and external forces (Ogle 1985:30-31). By 1961, however, both superpowers were once again conducting tests. In 1963, the United States, Soviet Union, and Great Britain ratified the Limited Test Ban Treaty, sending all weapons-related tests underground and prohibiting tests in the air, at the surface, and underwater (Friesen 1995:6).

Although atmospheric testing ended, underground testing activities at the NNSS steadily expanded, and testing occurred on a year-round basis in the 1960s. In addition, the Plowshare Program and the Nuclear Rocket Development Station (NRDS) brought increased activity to the site (Fehner and Gosling 2000:83; NNSA/NFO 2013). This required additional construction to meet demands for a wide range of new facilities.

In 1962, an AEC supplemental appropriations bill provided funds to add to or replace most of the earlier temporary buildings at the site and included a \$15 million request for permanent NNSS construction (NNSA/NFO 2013). By June, the AEC contracted Arthur Benedict Associates (ABA) of

Los Angeles, California, to develop a long-range comprehensive master plan for the coordinated development of Mercury.

The Mercury Master Plan (ABA 1962) proposed an expansion of all facilities to create a permanent site. Facilities programmed for construction during fiscal years 1963 and 1964 were support facilities; the cafeteria and food handling areas; administrative and office buildings; laboratories; maintenance shops; warehouses; communications; the Civil Effects Test Organization building; resident-oriented facilities such as the dormitories, recreation hall, swimming pool, bowling alley, chapel, and health/medical and safety building; and circulation facilities such as the Camp Desert Rock airstrip, U.S. Route 95 improvements, the Mercury Bypass, primary and secondary streets, utilities, a new power transmission line, and a sewage treatment plant (Figure 4).

Underground testing on the NNSS continued at a steady pace until 1992, when the United States established a second self-imposed moratorium on nuclear testing. In the 1970s and 1980s, buildings and structures were added throughout the site to meet mission demands and improvements in technology. However, many of the earlier buildings remained in use until 1992 and beyond, including Building 23-702.

After 1992, the DOE began conducting subcritical experiments at the NNSS to maintain the safety and reliability of the national nuclear stockpile without conducting full-scale tests. Main activities on the NNSS through the present day include subcritical experiments and other Stockpile Stewardship programs, along with planning, experimentation, and training to prevent and counter global and homeland security threats.

Building 23-702 was constructed in 1965, fits within the 1951-1992 period of significance for the NNSS, and is associated with Cold War-era nuclear testing. Designed by Guirey, Snrka, and Arnold and constructed by Holmes & Narver, Building 23-702 was used as the foil handling building for LASL's Health Division H-8 group.

The Work of the LASL on the NNSS

The LASL originated during the Manhattan Project and nuclear weapons research and development during World War II. In 1943, the laboratory was established for the purpose of designing and building a nuclear weapon. By July 16, 1945, the laboratory had completed the task and the world's first nuclear weapon was denotated at the Trinity Site. Later that year, nuclear weapons were used in Japan and by September 2nd, World War II had officially ended (LANL 2023; Fehner and Gosling 2006).

The AEC was established by the Atomic Energy Act of 1946 following the use of nuclear weapons to end World War II. The purpose of the act was to address government control of fissionable material, nuclear experiments for military applications, and regulations pertaining to the release of scientific and related data. The aim of the AEC was to maintain civilian government control of the research, development, and production of nuclear energy, including nuclear weapons (Anders 1978:2; Buck 1983:1; Fehner and Gosling 2006:29). The AEC took over the research and production facilities built by the Manhattan Engineer District during World War II and set about refurbishing them. These facilities in New Mexico became the LASL (Loeber 2002:154). Development and production of the weapons took place at Sandia Laboratory (now called Sandia National Laboratory [SNL]) in Albuquerque, New Mexico; the Y-12 Plant (now the Y-12 National Security Complex) in Oak Ridge, Tennessee; Hanford Nuclear Reservation in Washington (now known as Hanford Site); and the Rock Island Arsenal in Illinois (Anders 1978:3; Brady et al. 1989:18-19; Buck 1983:2; Stapp 1997).

In 1947, the LASL was formally established as a national laboratory for the DOE and by 1951, the LASL was involved in the development and construction of nuclear technology for testing on the NNSS (NNSA/NFO 2015). By 1952, the LASL was working on the NNSS alongside the newly formed Lawrence Livermore National Laboratory (LLNL), a branch of the University of California Radiation Laboratory in Livermore, California. Both national laboratories conducted nuclear research broadly similar in scope to one another but sponsored different nuclear tests on the NNSS (Brady et al. 1989:18; Friesen 1995:5).

Between 1951 and 1992, there were 1,021 nuclear detonations among 928 tests on the NNSS. During this time period, LASL sponsored numerous tests, some in conjunction with the Department of Defense and SNL, as well as the United Kingdom. The majority of the tests sponsored by LASL were conducted for a weapons-related purpose (testing a device intended for a specific weapon system). Additional nuclear tests sponsored by LASL were conducted for other purposes and included weapons effects (evaluating the civil or military effects of a detonation); safety experiments (confirming a nuclear detonation would not occur from an accidental detonation of the high explosive associated with the device); joint United States–United Kingdom testing; and the Vela Uniform program (improving the ability to detect, identify, and locate underground nuclear detonations) (NNSA/NFO 2015). Technical divisions from LASL that were principally concerned with nuclear testing on the NNSS were J, W, GMW, and H. Groups in these divisions permanently assigned to nuclear weapons testing on the NNSS included multiple J groups (J-3, J-6, J-7, J-8, and J-DO), as well as H-8 and SP-DO (LASL 1967).

The LASL was also involved in nuclear rocket research at the NNSS. In the mid-1950s, an article by physicist Robert W. Bussard (1953) influenced the U.S. Air Force to direct LASL and LLNL through the AEC to study the feasibility of linking nuclear power with rockets (AEC 1962; Baker 1996; Bussard and DeLauer 1965; General Advisory Committee 1956; House 1963). The great appeal of nuclear propulsion, as opposed to chemical propulsion, was its smaller size and greater velocity to enable bigger payloads (Angelo and Buden 1985; Schreiber 1961). The NNSS was chosen as the place to conduct the nuclear tests for a number of reasons. The NNSS already had a record of nuclear activity with the testing of

nuclear weapons, a possible excursion within a reactor could be handled more readily than at other testing sites, the reactor tests would release a radioactive exhaust plume into the atmosphere that was acceptable for the NNSS at the time, and the two national research laboratories (LASL and LLNL) that would conduct the research were already established at the NNSS (AEC 1958a; Bernhardt et al. 1974; Dewar 2004; House 1963; Friesen 1995). Constructing and testing nuclear reactors and engines for rockets was assigned to LASL as part of Project Rover, while the LLNL was given a similar task for nuclear ramjets under the Pluto Program (AEC 1958a, 1958b; Merkle and Reynolds 1962; Schreiber 1958).

The LASL's nuclear rocket research focused on engineering nuclear reactors and engines for space application at the NRDS in Area 25 for the Nuclear Engine for Rocket Vehicle Applications (NERVA) program under Project Rover. The NERVA program was organized as a joint National Aeronautics and Space Administration (NASA)/AEC program. For NERVA, the LASL developed reactor fuel and reactor systems that would operate with hydrogen at temperatures above 2,200 degrees kelvin (Robbins and Finger 1991). Construction of test facilities in Area 25 began in 1957 (House 1963) and nuclear reactor testing continued until 1973, when the NERVA program was terminated (Finseth 1991). The LASL's work during this period resulted in the development and testing of the Kiwi, Phoebus, and Peewee reactor designs (see Figures 5 and 6).

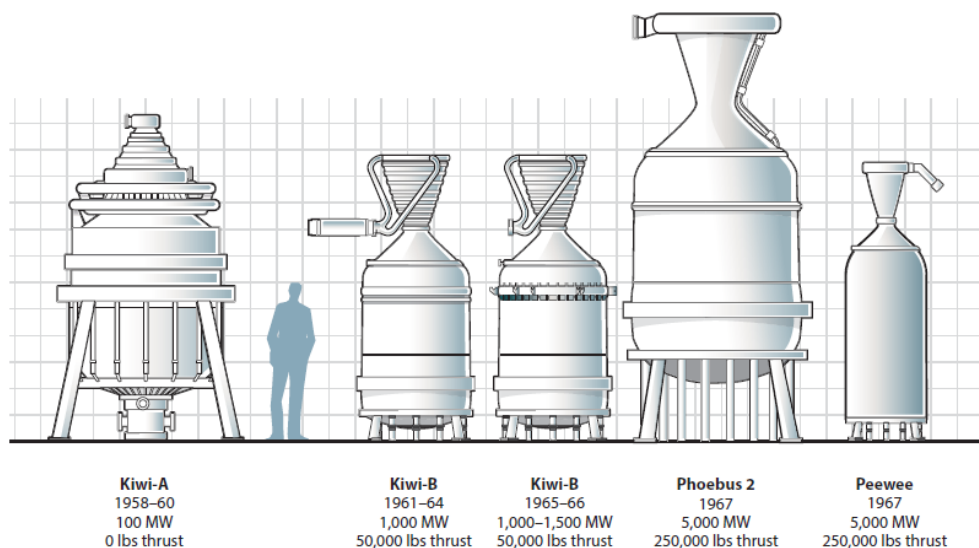


Figure 5. Comparison of Project Rover nuclear rocket reactors (taken from Malenfant et al. [2021]).



Figure 6. Phoebe 2-A, a nuclear reactor tested in 1968 during Project Rover (taken from LANL [2022]).

Health Division H-8 Group

The LASL H-division was formed in 1946 and consisted of four original groups focused on health-related purposes. The H-8 group was established later in 1961. Originally known as Field Studies from 1961 to 1971, the group was later renamed Environmental and Field Programs in 1971, Environmental Studies in 1973, and finally Environmental Surveillance in 1978 (Carr 2020). The principal responsibilities of the H-8 group were to investigate health and safety issues associated with radioactivity from reactor operations at the NRDS (Pillai et al. 2022) and later underground testing activities on the NNSS (LASL 1967).

The H-8 group first worked on the NNSS to conduct radiological safety tasks in association with Project Rover. The group was responsible for measuring radioactivity released from the experimental Project Rover reactors that were being ground tested. Beginning with the first Kiwi test in July 1959, the group studied, evaluated, and predicted radiation safety problems resulting from the nuclear rocket propulsion systems. Experiments involved measuring integral gamma and neutron radiation by investigating the distribution of radiation leakage from the reactors, assessing radiation variation at different distances, and understanding the shielding effects of several types of structures. Detailed explanations of the dosimetry methods and systems to collect these data can be found in various historical LASL reports (e.g., Worman et al. 1963; Henderson et al. 1963; Lee and Worman 1965; Worman and Lee 1965; Worman and Ahlquist 1966; Ahlquist 1967).

As part of their duties, H-8 group personnel stationed air samplers around the NNSS to monitor airborne radioactive particles, and placed neutron and gamma detectors on reactors themselves and at various distances up to 3,000 feet. To accomplish these tasks, the H-8 group received support from the on-site contractor REECo. Samples collected by the H-8 group were initially analyzed in Building 23-701, a LASL-operated radiological laboratory adjacent to 23-702 in Mercury. Building 23-701, constructed in 1964 and informally referred to as the “Mouse House” (LASL 1964; AEC 1969; REECo 1993), had a fission foil counting room (see Figure 7) prior to the construction of 23-702 a year later. After the data were analyzed, the H-8 group interpreted the data to assess potential hazards associated with actual nuclear rocket flights, particularly regarding 1) how reactor power levels affected the amount of radioactive material released, 2) how effective different types of shielding were, and 3) how weather conditions affected the dispersal of radioactive effluent (LASL 1964). Altogether, the data collected by the H-8 group helped in the design of some of the reactors and test cells at NRDS (LASL 1964).

By 1967, the H-8 group was integrated into the larger radiological safety program on the NNSS. Known as Rad-Safe, the program was conducted by REECo with H-8 providing oversight and being responsible for documenting radioactive effluent release from underground testing events. With the signing of the Limited Test Ban Treaty in 1963, studying radioactive effluent associated with the underground testing program was of great importance (Shipman 1969). During this time, H-8 group personnel also served as health physics advisors to test group directors (LASL 1967). In 1971, the group combined with H-6, another health division group, to become Environmental and Field Programs. The merger placed the responsibility for radiological surveillance of LASL test activities and plant environments into one group. The Field Support section of the H-8 group continued to provide health physics advice and support on test operations, including the development of special field monitoring techniques and instrumentation, evaluation of special test problems, data analysis, and reports (LASL 1971).

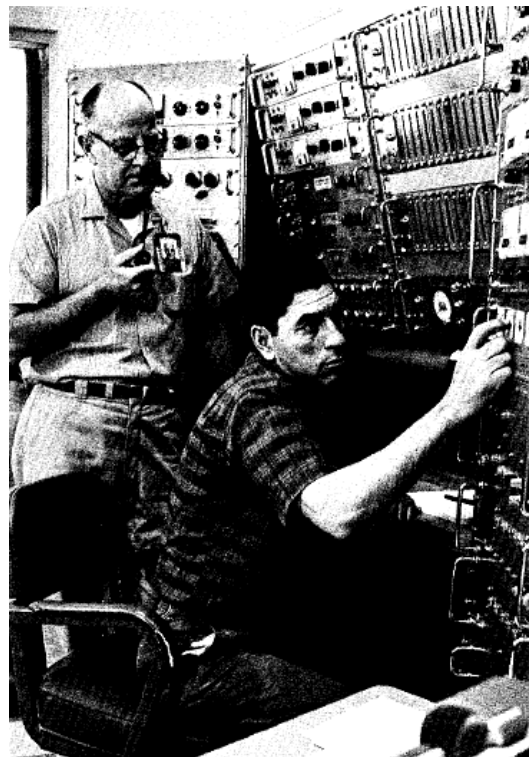


Figure 7. H-8 group personnel Frederick Worman and Frank Montoya calibrate instruments in the fission foil counting room in the Mouse House, 1964 (best copy available; taken from LASL [1964:16]).

It is likely that in the late 1950s and early 1960s, personnel from the H-8 group were stationed in Los Alamos but traveled to the NNSS. By the mid-1960s, particularly after Mercury became a more permanent base, some H-8 group personnel became stationed at the NNSS on a more regular basis.

Architects and Engineers

Holmes & Narver

Holmes & Narver was active from the initial construction of what is now the NNSS through the end of the Cold War. This work was part of Contract 20, which was the longest-running single contract ever administered by the U.S. government. James T. Holmes and D. Lee Narver started the firm in 1933 in Los Angeles to repair earthquake damage to a large number of buildings. The firm entered the realm of government-base design in 1940 with the designs of Camp Roberts and Camp Nacimiento for the Army, followed by a number of wartime military bases. Design of the nuclear test facility at Enewetak in 1947 foreshadowed the firm's role in designing the new base camp of Mercury in 1951. The firm was extremely active during the Cold War with projects including facilities at Naval Air Weapons Station China Lake, Douglas Aircraft, and overseas military bases. Much of the work Holmes & Narver did at Mercury, as well as the rest of the NNSS, was the unglamorous job of perpetually altering buildings to keep pace with changing mission requirements (Reno et al. 2018).

Although the military-related contracts were central to the work performed by Holmes & Narver, the firm also had significant civilian commissions, such as the 1958 TWA terminal at Los Angeles International Airport. Holmes & Narver ceased to exist as an independent firm in 2001. It was acquired by Daniel, Mann, Johnson & Mendenhall (DMJM), which was in turn acquired by AECOM (Reno et al. 2018).

Guirey, Srnka & Arnold

Guirey, Srnka & Arnold was an architecture firm based in Phoenix, Arizona, with a satellite location in Flagstaff. Established in 1961, the principals of the firm included Fred M. Guirey, Milan E. Srnka, and Richard M. Arnold. Later in the 1960s, the firm added George Sprinkle as a fourth named partner. Guirey, Srnka, Arnold & Sprinkle lasted until 1982, when the firm merged with DMJM (Lockley 2009).

Of the three original partners listed on NNSS drawings, the most has been written about Guirey. He was a prolific and highly regarded modern architect in Phoenix and throughout Arizona, both before and during his partnerships with Srnka, Arnold, and Sprinkle (Aazami and Brown 2020; Lockley 2009). His body of work included single- and multifamily residences, office buildings, university and educational buildings, government buildings, hospitals, religious buildings, mausoleums, libraries, and stadiums. He achieved entry into the esteemed American Institute of Architects College of Fellows in 1969 and is known as a defining figure in the architectural landscape of Phoenix in the postwar period (Aazami and Brown 2020; Lockley 2009).

Little pertinent information about Srnka and Arnold, other than their partnership with Guirey, was found in the research conducted for this report. However, it appears that Srnka had a special interest in industrial architecture based on his listing as the president of the Arizona Association for Industrial Development from 1979 to 1980 (AAED 2021) and his known association with projects such as the Arizona Highway Department Durango Equipment and Maintenance Shop (AHD 1973:5) and buildings on the NNSS (REEC0 1964:8).

IV. RESOURCE DESCRIPTION

The following section describes Building 23-702. Although the MHD is included as part of the APE for the undertaking to account for effects to the district, it is not described in detail herein. This report focuses on the individual evaluation of Building 23-702. The MHD is described in detail in Reno et al. (2018).

Building 23-702, LASL H-8 Foil Handling Building

History and Evolution of Building 23-702

Designed by Guirey, Snrka & Arnold, Building 23-702 was constructed by the engineering firm Holmes & Narver. The building was originally known as the H-8 Foil Handling Building. According to later NNSS Building Inventories (NTS 1994), the building appeared to have secondarily functioned as source storage in the 1980s and 1990s.

Research conducted during the preparation of this report did not find direct reference to the use of this building beyond its name and function. However, based on the H-8 group's radiological safety and measurement responsibilities on the NNSS, the building appears to have been built a year after Building 23-701 as a dedicated laboratory space to collect and analyze data related to neutron and gamma detection and other dosimetry research. Among other methods, the H-8 group utilized threshold detector units in the field to obtain neutron and gamma measurements. To capture neutron data, the units often consisted of plutonium, neptunium, and uranium fission foils in a boron-10 sphere, a sulfur pellet, and bare and cadmium-covered gold foils. To collect gamma-related data, the units utilized glass rods and cobalt borosilicate glass plates (Figure 8). For neutron measurements, the cadmium and boron-10 in the unit absorbed thermal neutrons. After the units were recovered from the field, a neutron spectrum could be defined after the rate of decay was measured and analyzed using specialized equipment (see Figure 9 for an example of the equipment). This type of specialized equipment was likely housed in Building 23-702.

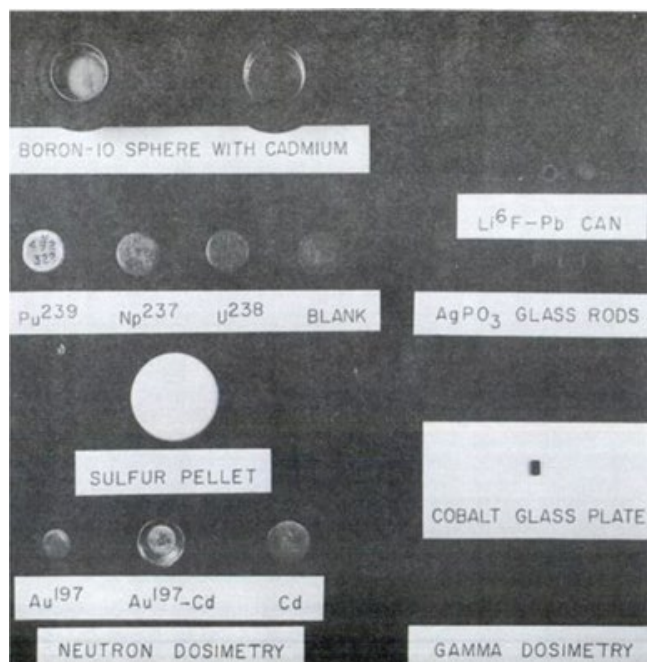


Figure 8. Neutron and gamma detectors (taken from Worman et al. [1963:39]).

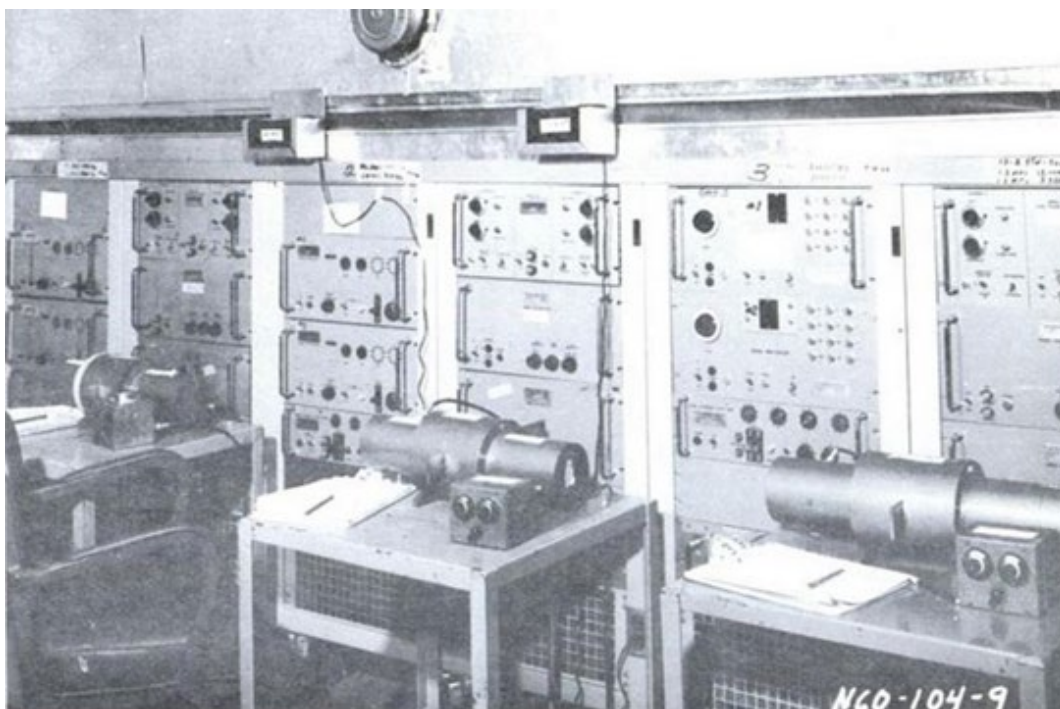


Figure 9. Fission foil counting setup (taken from Henderson et al. [1963:30]).

Building 23-702 was constructed by June of 1965 based on as-built notations on historical engineering drawings (Figure 10). The building was constructed as a one-story, rectangular plan concrete masonry building with no windows and a corrugated metal roof. The footprint of the building was 17 feet 4 inches by 38 feet and had a height of 9 feet 4 inches. Total interior square footage was 555 square feet. The building sat on a concrete foundation. Its exterior walls were composed of 14 courses of 8-inch concrete masonry unit blocks. The roof was designed as almost flat but with a slight 1/8-inch slope from the midline to the east and west elevations. It had built-up material covering rigid insulation on top of a lightweight corrugated metal deck, and it extended 1 foot out from the building exterior. The roof eave was surrounded by 24-gauge galvanized metal fascia. Installed on the roof were galvanized metal vents and filter and exhaust ductwork.

As constructed, the primary elevation was the north elevation (Figure 11). On the left side of the elevation was an entry door that had a hollow metal frame with a plate glass window. A building sign was to the left of the entry door and communications cabling and boxes were to the right. Another hollow metal access entry door was on the south elevation. Unlike the north elevation, this door had no windows. Both doors had an 8-foot by 4-foot concrete pad in front of them. The west elevation had a metal ladder near its center to access the roof and mounted electrical equipment that powered conduit cabling on the roof. The east elevation of the building was bare. The area surrounding the building was graded and leveled (Figure 12).

The interior of the building was partitioned into three rooms of varying sizes. Available historical engineering drawings do not specify the function of each room. Room 101, a rectangular-shaped space, encompassed the southern half of the building. Room 102, a small square space, was near the center of the building along the west wall and the remainder of the building was occupied by Room 103, an L-shaped room.

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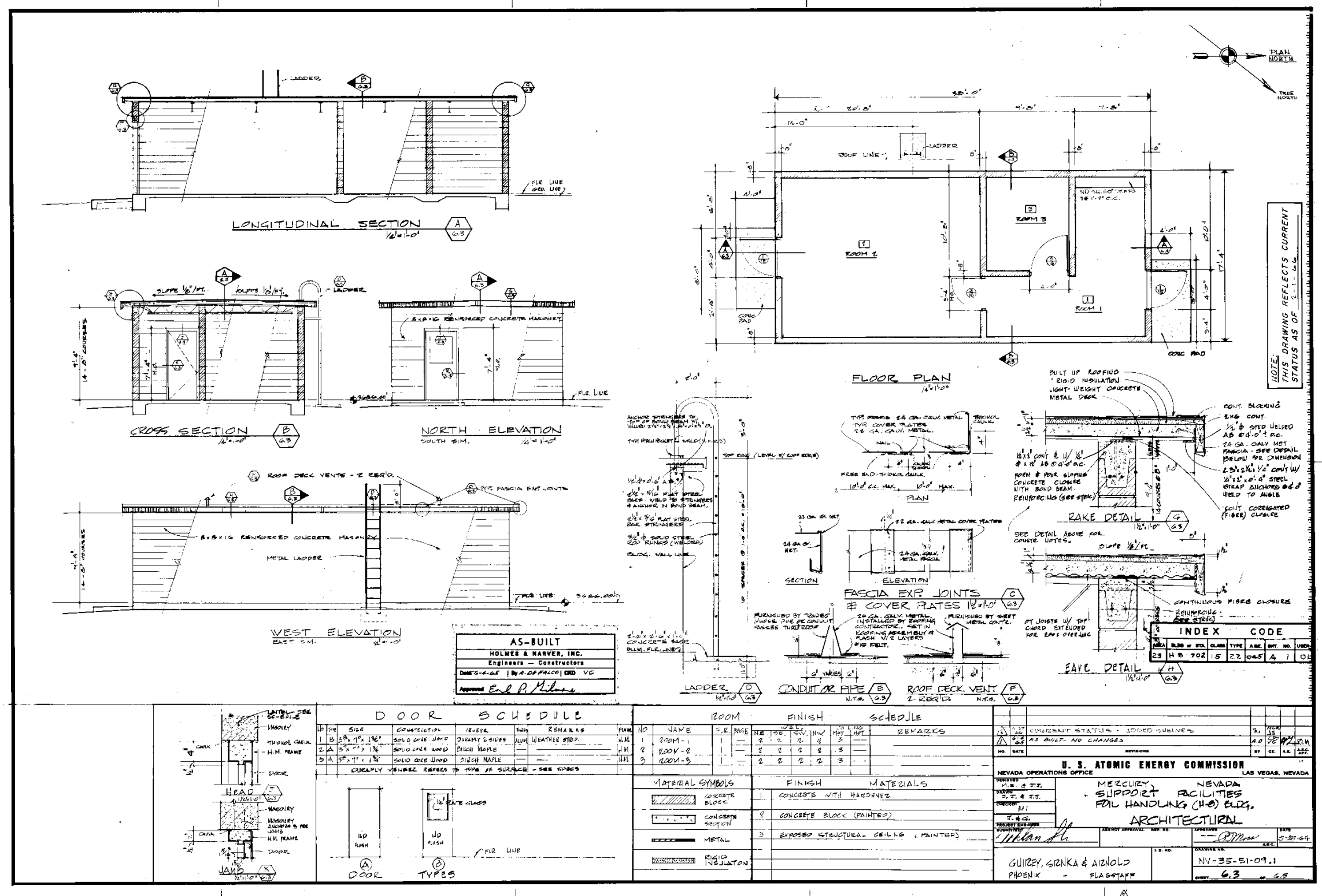


Figure 10. Plan and exterior elevations of Building 23-702, May 28, 1964 (Guirey, Snrka & Arnold 1964).

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2539-6

Figure 11. Building 23-702, north and east elevations, September 7, 1967, facing south (REECo 2539-6).



3028-10

Figure 12. Building 23-702, aerial view, May 3, 1965, facing southeast (REECo 3028-10).

Little information is available regarding alterations to the building. One historical engineering drawing from 1975 indicates the building's roof was altered and new relief vents and conduits were installed (REECo 1975). A comparison of historical photographs and aerial imagery shows that the building was also modified after 1991. The large exhaust stack original to the building was intact until 1991 (Figure 13) but removed sometime prior to 1998. The building's trim and doors were also repainted from a dark red or brown to a desert tan sometime after 1992.



Figure 13. Aerial image showing Building 23-702 in 1991 (best copy available; modified from National Archives [1991], id 75491325).

Current Description

Building 23-702 is currently not in use and the building's interior has been emptied. According to NNSS Building Inventories, the building was operational until 2004, and then deactivated sometime between 2005 and 2014. Although the building has been painted a desert tan color, the exterior of the building remains similar to its historical appearance with few alterations or additions (Figures 14 and 15). The doors and exterior lighting are original to the building (Figure 16), as is most of the visible communications equipment on the roofs and walls of the building. Cabling that routed from the building to overhead power and communications lines has been cut and most of the prominent ventilation on the roof has been removed. One addition to the building are yellow safety railings on the west side of the roof.



Figure 14. Building 23-702 north and east elevations, facing southwest (2360_0087, DRI 2023).



Figure 15. Building 23-702, south and west elevations, facing northeast (2360_0091, DRI 2023).



Figure 16. North elevation entry door, lighting, signage, and communications equipment, facing south (2360_0094, DRI 2023).

The most recent space management plan produced in 2015 by the NNSS management and operating contractor shows the interior configuration remains as it was during the period of significance (Figure 17). However, all scientific equipment has been removed from the building and only a few furnishings and utilities remain. Room 101 is bare, except for a copper grounding busbar on the south wall (see Figure 18) and wall outlet strips on the north and east walls. Room 102 is empty. On the west wall of Room 103 is an original set of wooden shelves (Figure 19) and adjacent to the shelving is a circuit breaker box. A water heater is in the northeast corner of the room. The rest of the room is bare except for wall outlet plug strips on the north and east walls and a stand-alone metal cabinet abutting the east wall (Figure 20). Throughout the building the ceiling has exposed corrugated metal panels, ductwork, and fluorescent lights. The floor is concrete.

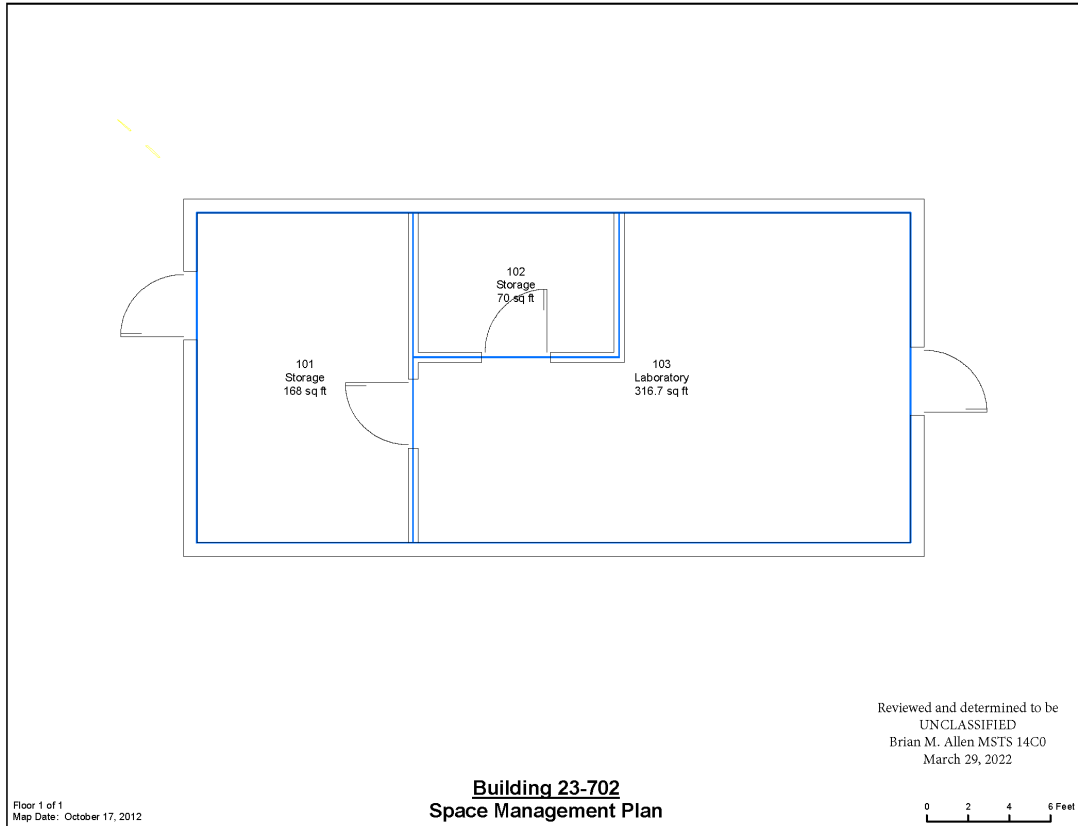


Figure 17. Space management plan for Building 23-702, dated October 17, 2012 (MSTS 2022).



Figure 18. Room 101, showing a grounding busbar near southern entrance (2360_0172, DRI 2023).



Figure 19. Room 103, leading into Room 101 showing the cabinet, facing south (2360_0163, DRI 2023).



Figure 20. Room 103, showing shelving, facing west (2360_0164, DRI 2023).

To the southwest of Building 23-702 is the LASL radiological laboratory (23-701) and to the northeast is the Weather Maintenance/Dosimetry Laboratory (23-703). To the north, on the opposite side of Jackass Flats Road, is a large storage yard with electrical and communications equipment. This immediate vicinity has had little to no changes since the period of significance, except for the removal of various portable equipment and trailers.

Alterations Summary

Building 23-702 appears to have undergone few alterations since its construction in 1965. Archival review of historical documents only produced one engineering drawing indicating alterations to the building's roof in 1975. No other alterations were noted until the 1990s. After 1992, the exterior walls and roof trim were repainted, and a large exhaust stack and ventilation and air conditioning equipment were removed from the roof. Within the interior of the building, no changes have occurred to the configuration of rooms, walls, or ceiling. Original shelving and a metal cabinet are intact in one of the rooms, but the remainder of the furnishings and equipment original to the building has been removed, likely following the building's deactivation after 2005.

V. NATIONAL REGISTER EVALUATION OF BUILDING 23-702

As previously noted, Building 23-702 is a contributing element to the NRHP-eligible MHD. The following section details the evaluation of its individual eligibility for listing in the NRHP. Based on this evaluation, Building 23-702 is not recommended as individually eligible for listing in the NRHP.

Secretary of the Interior's Significance Criteria

Criterion A

To be significant under Criterion A, a property must be directly associated with events that have made a significant contribution to the broad patterns of our history. Although Building 23-702 was constructed to support the activities of LASL's health division and the work conducted in the building had an association with radiological safety and monitoring on the NNSS, the building itself is not important in illustrating the theme of the work of LASL within the context of nuclear testing on the NNSS. The LASL's significant role in the successful development and testing of nuclear devices is more readily demonstrated in locations outside of Building 23-702 and Mercury in forward areas of the NNSS, such as Frenchman and Yucca Flats, Pahute Mesa, and Jackass Flats. It is in these locations where buildings and structures were used by the LASL to design, engineer, and test nuclear devices. These locations are more likely to have significant and important associations with the relevant theme and context. By contrast, Building 23-702 was constructed as a building to handle fission foils. In this capacity, the building only served a supporting function to the overall LASL programs on the NNSS. Although resultant data may have helped in later engineering designs for some of the reactors and test cells at the NRDS, there is no evidence or historical documentation that the building's associations with the scientific efforts of LASL at the NNSS were important in their own right. To be eligible for the NRHP under Criterion A, mere association with an important event or trend is not sufficient; the association itself must be important (NPS 1997: 12). Therefore, Building 23-702 does not appear to be significant under Criterion A.

Criterion B

To be significant under Criterion B, a property must be directly associated with the productive life of a significant person. There is no evidence to suggest Building 23-702 has a direct association with any significant person. Although Building 23-702 was a dedicated laboratory space for the LASL H-8 group, there is no indication that any significant person was connected with the work in Building 23-702. It is likely that any such person would have been more closely associated with locations where the LASL conducted important testing and experimentation on the NNSS. Building 23-702 does not appear to be significant under Criterion B.

Criterion C

Properties significant under Criterion C must embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic values; or represent a significant and distinguishable entity whose components may lack individual distinction.

To embody the distinctive characteristics of a type, period, or method of construction, a property must clearly illustrate the distinctive characteristics of a pattern of features common to a particular class of resources, the individuality or variation of features that occur within the class, or the evolution or transition between classes of resources (NPS 1997:18). Building 23-702 does not clearly illustrate any of these distinctive characteristics. Building 23-702 is a Category I building in the MHD because it was the only building of its exact type constructed in the district. However, the design and construction methods are not distinctly different than other buildings built in Mercury at that time. The architecture of

Building 23-702 is an example of a simple, concrete block masonry type that was designed to be utilitarian in nature with limited defining architectural features. In addition, although the building was constructed to serve as a foil handling building, it had few modifications to reflect its radiological measuring and safety purpose. The building as a single-story, rectangular-plan building is similar to many of the other utilitarian buildings in Mercury and is not a unique or outstanding example compared with its contemporaries. Therefore, the building does not embody the distinctive characteristics of any particular type, period, or method of construction.

Furthermore, Building 23-702 is not the work of a master architect, nor does it possess high artistic values. As defined in *National Register Bulletin #15*, “A master is a figure of generally recognized greatness in a field, a known craftsman of consummate skill, or an anonymous craftsman whose work is distinguishable from others by its characteristic style and quality” (NPS 1997:20). Building 23-702 was designed by Guirey, Snrka & Arnold and constructed by Holmes & Narver. Guirey, Snrka & Arnold was an architectural firm from Arizona. None of the principals in this architectural firm are considered masters in their field. The design of Building 23-702 exhibits a standard plan and a minimal design for the sake of maximizing efficiency rather than achieving architectural excellence. Building 23-702 is not significant under this portion of Criterion C.

Lastly, properties may be significant under Criterion C if they represent a significant and distinguishable entity whose components may lack individual distinction. This part of Criterion C is not applicable to Building 23-702 as an individual resource.

Criterion D

Properties significant under Criterion D must have the potential to yield further information about human history that can only be answered by the actual physical material of the resources. There are two requirements for a resource to be found significant under Criterion D: the property must have or have had information to contribute to our understanding of human history or prehistory, and the information must be considered important. Building 23-702 has been subject to research on its history in the community of Mercury and its architecture, both of which are known. It is unlikely that the actual physical material of the building could yield any more information that would be considered important. Building 23-702 does not appear to be significant under Criterion D.

Integrity Analysis

To be eligible for listing in the NRHP, a property must possess both significance and physical integrity. It does not appear that Building 23-702 possesses significance. However, it does retain aspects of its integrity. Building 23-702 retains its aspect of location, as it is still in the location where it was constructed. Building 23-702 mostly retains integrity of design, despite the removal of all scientific equipment because there have been no major alterations to the building itself. Although some small modifications to the building over time have included new paint and the removal of ventilation and air conditioning equipment on the roof, all other building details and features are otherwise original to the building, including the doors and the building’s interior configuration. The integrity of setting in the immediate surrounding area around Building 23-702 is intact. Buildings and storage yards built during the period of significance for the MHD are intact and within the immediate vicinity of its setting there is no new construction. However, further to the east, there is new construction and multiple original Mercury buildings and structures have been removed. Therefore, there is some loss of integrity of setting due to the removal of a number of original buildings and structures in the larger Mercury area. Building 23-702 retains integrity of materials, workmanship, feeling, and association. As previously stated, limited modifications have occurred to the building, and therefore the integrity of materials is maintained. The

building is also a good example of the workmanship of a simple, one-story, rectangular, concrete masonry building. Lastly, the building conveys the sense of feeling of a support building in the town of Mercury, and its association with Cold War era activities on the NNSS is apparent based on its location and simple design and the construction materials utilized.

VI. CONCLUSION

Building 23-702 does not appear to be individually eligible for listing in the NRHP. Although it retains integrity, it does not possess individual significance under any of the established Significance Criteria. It remains eligible for the NRHP as a contributing element to the MHD.

Following consultation with the SHPO on the findings in this NRHP evaluation report, a Finding of Effect report will be prepared, along with mitigation documentation as specified in the Mercury PA, as appropriate. The mitigation will include an ARA Update form for the building, which will include the final NRHP evaluation determination resulting from SHPO consultation.

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