LA-UR 09-04611

Historic Building Assessment of the Chemistry and Metallurgy Research (CMR) Building (TA-3-29)

Historic Building Survey Report No. 280

Los Alamos National Laboratory

July 17, 2009
Survey No. 1052

Prepared for the U.S. Department of Energy
National Nuclear Security Administration
Los Alamos Site Office

prepared by

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LOS ALAMOS NATIONAL LABORATORY

Introduction

In accordance with Section 110 of the National Historic Preservation Act, the Department of Energy, National Nuclear Security Administration, Los Alamos Site Office has assessed the historical significance of a research facility located at Technical Area (TA) 3, Los Alamos National Laboratory (LANL) (Maps 1 and 2). The Chemistry and Metallurgy Research (CMR) Building was built in 1952 to support essential post-World War II scientific research (Map 3).

This report provides the information necessary to make a determination of eligibility for TA-3-29 (the CMR Building) and includes location maps, historical background information, a property description, and an eligibility recommendation. A LANL historic building inventory form is included as an appendix.

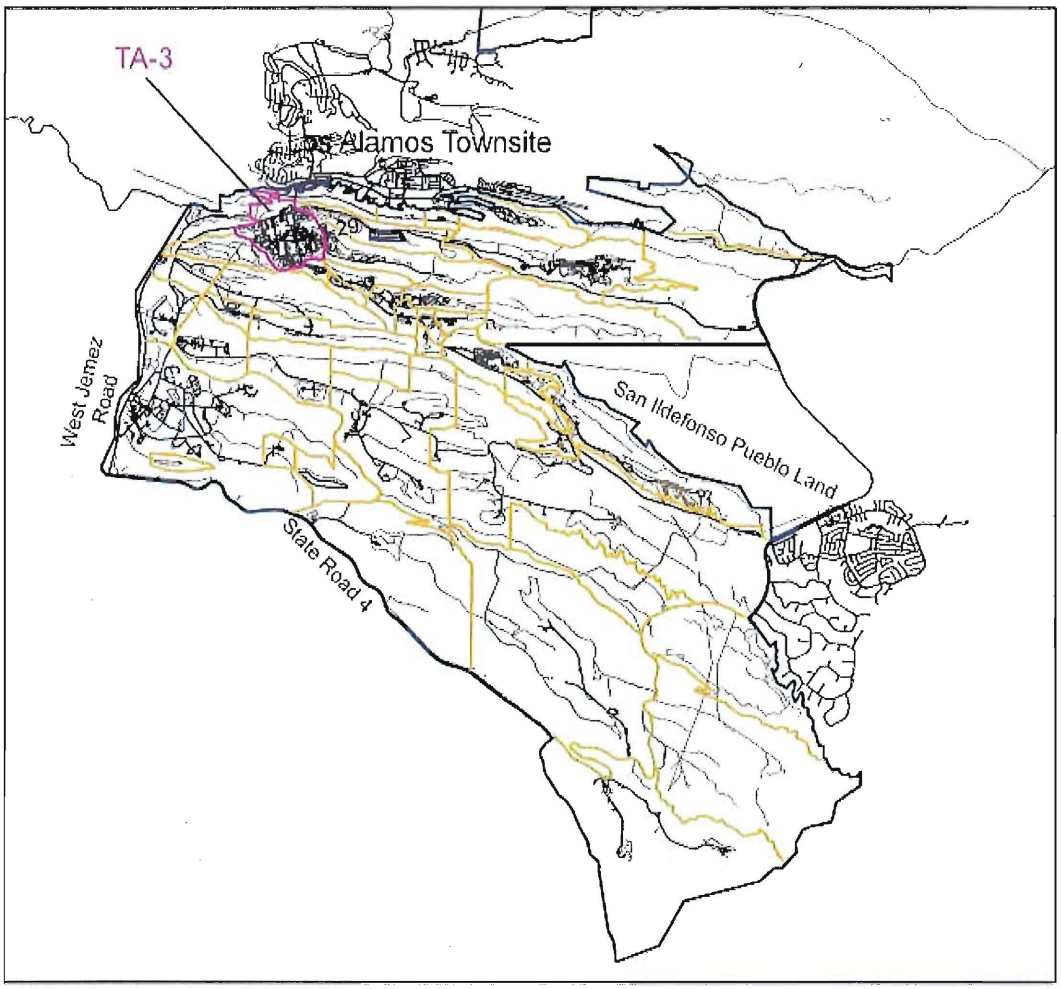
The State Historic Preservation Officer (SHPO) is requested to concur with the eligibility determination for TA-3-29 contained in this report.

Historical Background Information

Technical Area 3

TA-3, South Mesa Site, is a large technical area located on top of South Mesa, across Los Alamos Canyon from the town of Los Alamos, New Mexico. TA-3 currently functions as the administrative center of LANL, and numerous office and laboratory buildings, including the CMR Building (TA-3-29), are located at this technical area.

TA-3 was developed during the Manhattan Project for use as a firing site. Facilities associated with the earliest use of TA-3 included a shop, magazine buildings, and buildings for the storage and assembly of scientific hardware (Figure 1). The early Laboratory's administrative functions were relocated from downtown Los Alamos (old TA-1) to TA-3 during the 1950s. Construction began at TA-3 in 1950 on buildings that were to replace the wartime facilities located in the Los Alamos townsite (Figure 2). The first group of post-war properties, which included the CMR Building, became operational between mid-1951 and late-1952. A second stage of construction at TA-3 occurred during the mid- to late-1950s. Several major buildings were completed during these years, including the Laboratory's former administration building, TA-3-43 (Garcia and McLain 1999). The current administration building (the National Security Sciences Building or NSSB) was completed in 2006.



Los Alamos
National Laboratory
Cultural Resources Team
ENV-ECO Ecology Group

1:110,000
7,000 3,500 0 7,000 14,000 Feet
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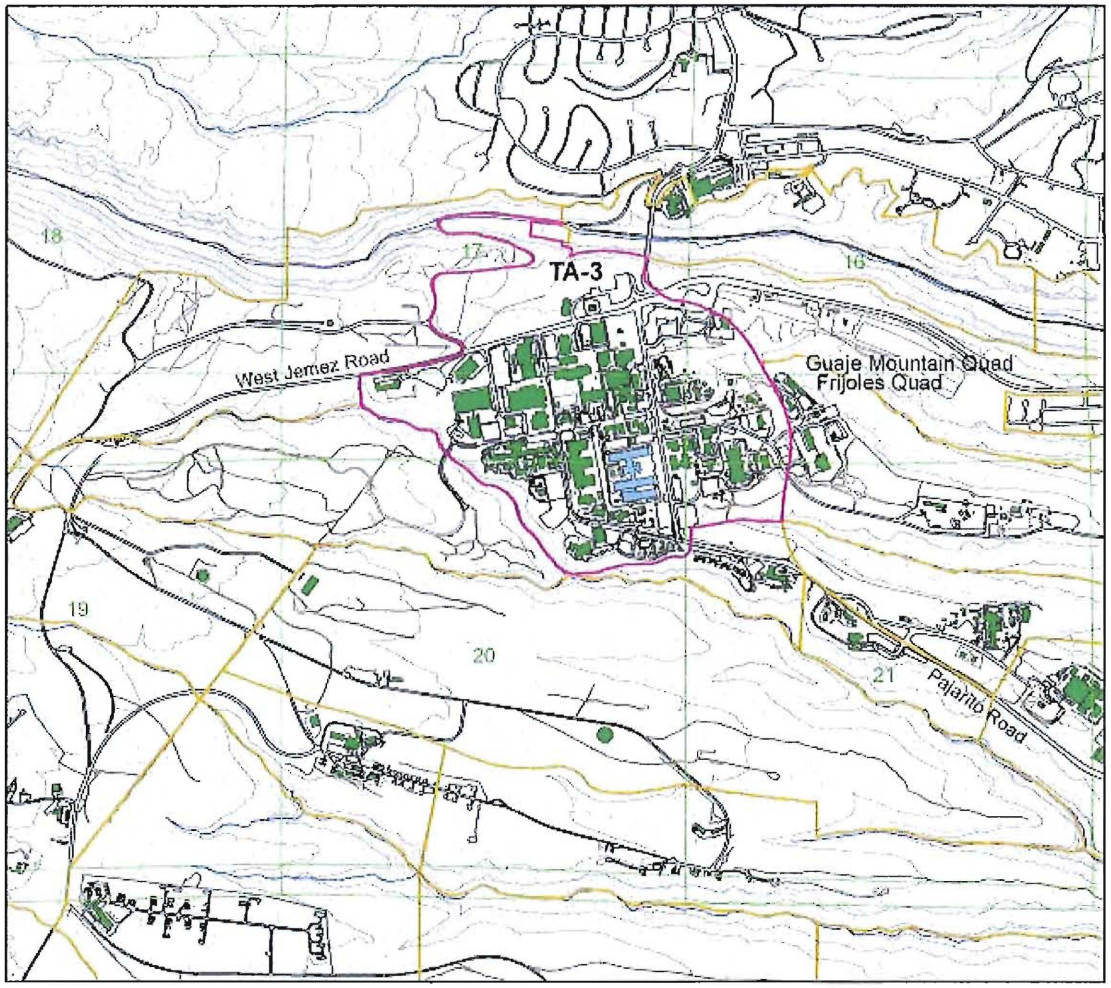
Technical Area 3
LANL Boundary
Technical Areas
Dirt Roads
Paved Roads

LANL Boundary and TA-3

Map 1



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National Laboratory

Cultural Resources Team
ENV-ECO Ecology Group

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2,000 1,000 0 2,000 Feet
500 250 0 500 1,000 Meters

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- Technical Area 3
- 20 Foot Contours
- 100 Foot Contours
- Building Currently Being Evaluated
- Technical Areas
- Drainage
- Township, Range, Section
- USGS 7.5 Minute Quad
- Dirt Roads
- Paved Roads
- Building/Structures

TA-3
CMR TA-3-29

Map 2

Los Alamos
National Laboratory

Cultural Resources Team
ENV-ECO Ecology Group

1:8,000

300 150 0 300 600 900 1,200 Feet

100 50 0 100 200 300 400 Meters

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W E
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- Building Currently Being Evaluated
- 20 Foot Contours
- 100 Foot Contours
- Technical Area 3
- LANL Boundary
- Technical Areas
- Drainage
- Township, Range, Section
- USGS 7 5 Minute Quad
- Dirt Roads
- Paved Roads
- BuildingStructures

CMR
TA-3-29

Map 3

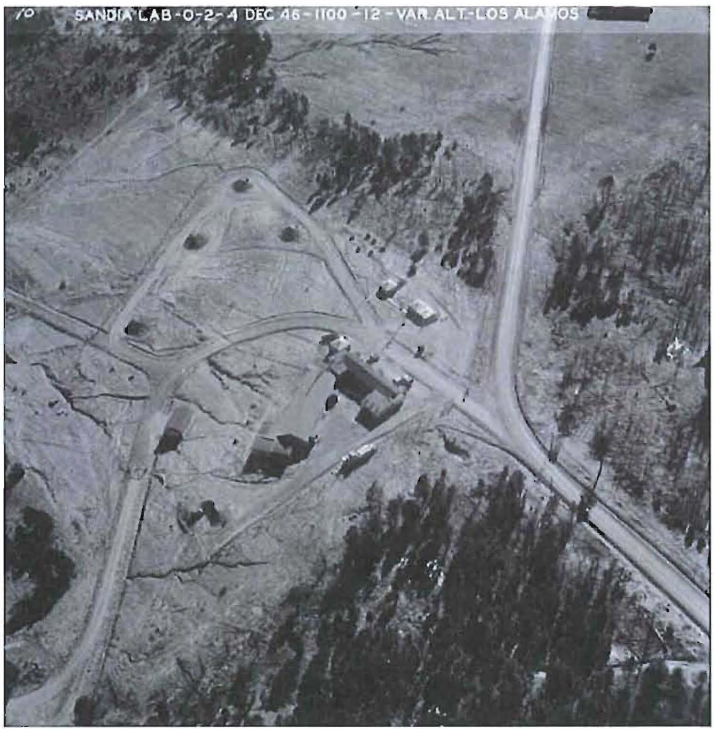


Figure 1. TA-3 in 1946

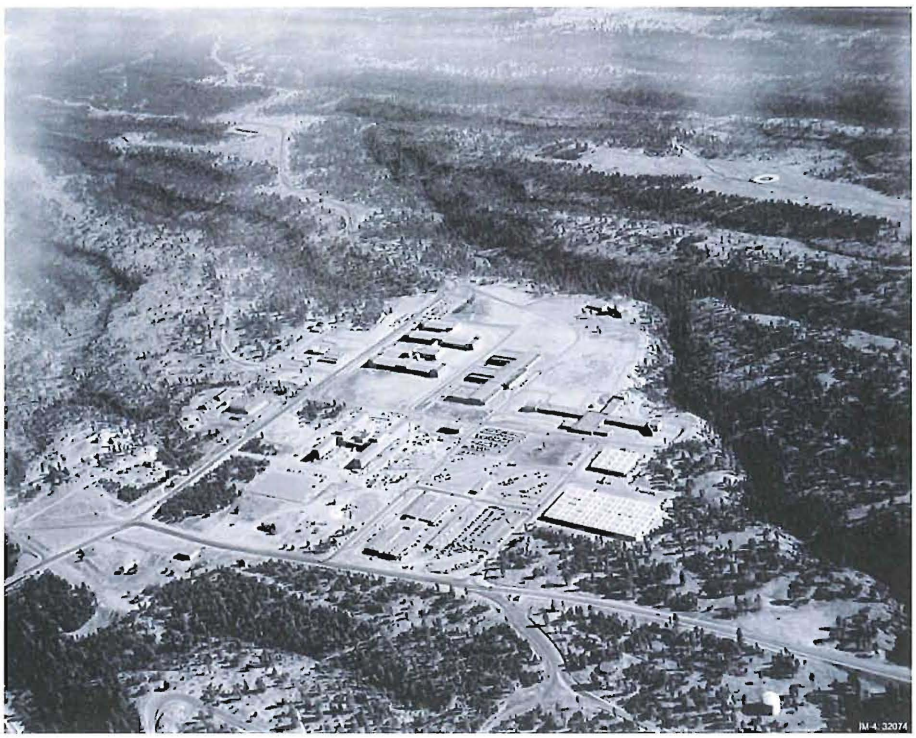


Figure 2. TA-3 in 1955

The Chemistry and Metallurgy Research Building (TA-3-29)

The CMR Building (TA-3-29) was designed within TA-3 for use as an actinide chemistry and metallurgy research facility (Figure 3). The main corridor and seven wings were constructed in 1952 (including the Administration Wing and Wings 1, 2, 3, 4, 5, and 7). In 1960, a new wing (Wing 9) was added for hot cell work (a hot cell is an enclosed area that allows for the remote handling of highly radioactive materials). Wings 6 and 8 were never constructed. In its current configuration, the two-story building (represented by two above-ground stories and a full basement) has eight wings connected by a spinal corridor and contains a total of 550,000 square feet (51,097 square meters) of space (Figure 4). The CMR Building is the Laboratory's only facility with full capabilities for performing Special Nuclear Materials (SNM) analytical chemistry and materials science activities in support of the nuclear weapons program.

Operational CMR capabilities include work with both radioactive and nonradioactive substances. Work involving radioactive material (including uranium-235, depleted uranium, thorium-231, plutonium-238, and plutonium-239) is performed inside hoods, hot cells, and gloveboxes. Chemicals such as various acids, carcinogenic materials, and organic-based liquids are used in small quantities, generally in preparation of radioactive materials for processing or analysis. Primary activities include analytical chemistry, uranium processing, destructive and nondestructive analysis, nonproliferation training, actinide research and processing, and fabrication and metallography.

In addition to the importance of the CMR Building's analytical chemistry and materials science capability, Wing 9 played an important historical role in a brief visit to Los Alamos by President John F. Kennedy and Vice President Lyndon Johnson on December 7, 1962 (LASL 1962). The President and his entourage were given a tour of a hot cell in Wing 9, and several members, including the President were allowed to manipulate a robotic arm. In addition, a model exhibit was placed in Wing 9 specifically for the President's visit. This exhibit focused on Project Rover, a program whose goal was the development of nuclear reactors to power space vehicles.

Figure 3. TA-3 in 1991; the CMR Building is located in the upper left

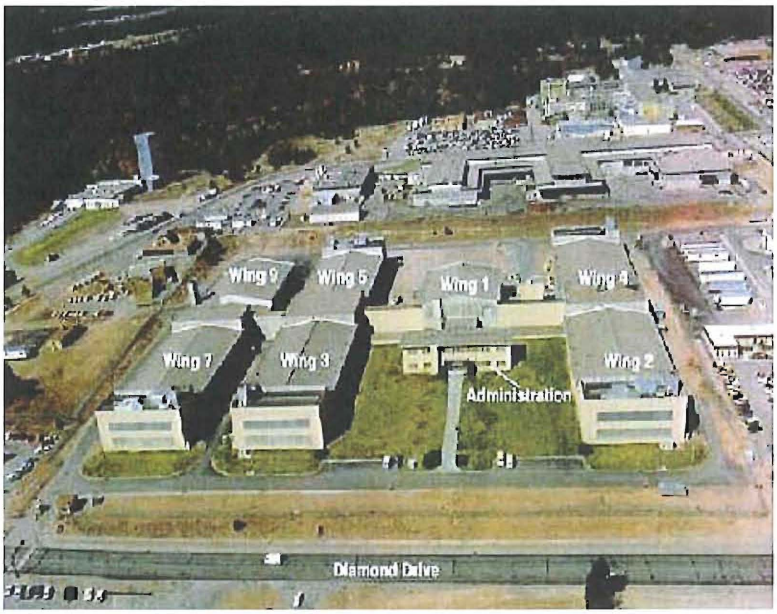


Figure 4. TA-3-29, CMR Building; looking west

The CMR Building was constructed in compliance with the standards in effect during the early 1950s. At the time it was built, the building contained state-of-the-art instrumentation, ventilation, and safety controls. Figures 5 and 6 depict the degree to which steel reinforcement and concrete is integral to the construction of the facility. According to an unconfirmed account, the CMR Building represented the largest concrete facility in the state of New Mexico at the time of its completion.

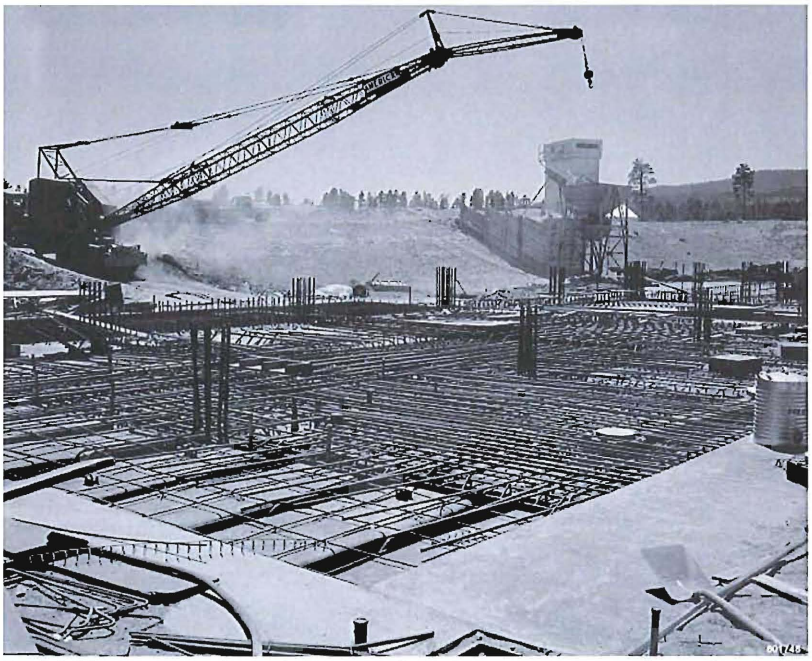


Figure 5. 1952 construction close up; showing concrete and steel reinforcement

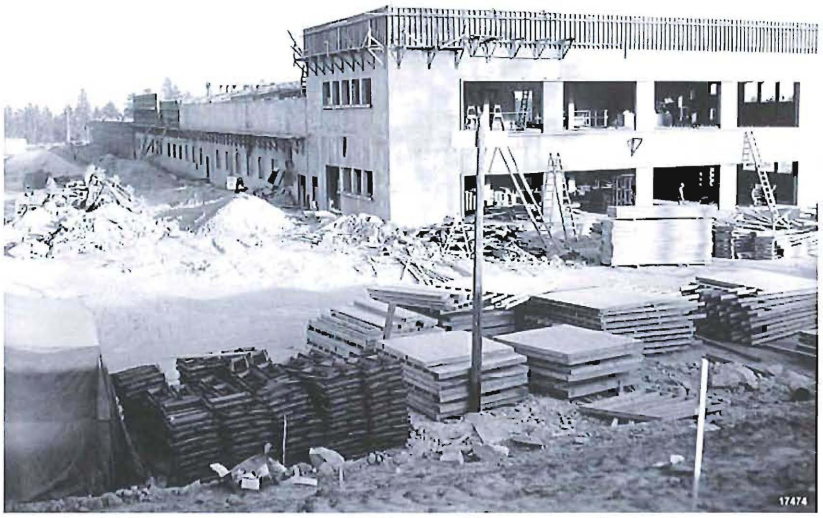


Figure 6. 1952 construction of Wing 2 (foreground), looking northwest

Property Description

Technical Area: 3

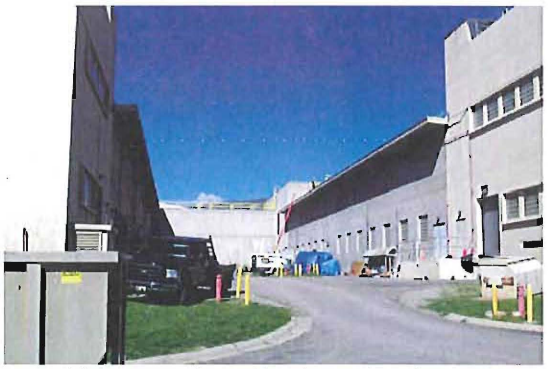
Building Number: 29

Original Function: CMR Laboratory
Current Function: CMR Laboratory
Date Constructed: 1952

Associated Theme: Cold War Nuclear Weapons R&D
Property Type: Laboratory/Processing
Integrity: Good
Core: Yes
Eligibility: A and C

Buildings with same floorplan within TA: none

East side of Wings 7, 3, 2 (near to far) looking north (note: silver colored panels are blow-out panels)



East side of central corridor (center) and area between Wings 7 (left) and Wing 3 (right)

East side of main entrance – Administration Wing

View of northwest corner looking along north wall to the east

Architectural Description:

TA-3-29 is a massive two-story building with a full basement level. The building was originally constructed in a modified H-shape with the Administration Wing and Wing 1 in the center flanked by Wings 2 and 4 running east/west along the north side, Wings 3 and 5 running east/west along the south side, and Wing 7 running east/west to the south of Wing 3. The original building was constructed with a reinforced concrete foundation and spread piers, concrete slab floors on each level, and poured-in-place concrete walls.

The roof was constructed with poured concrete panels finished with a built-up roofing system.

The main entrance is located on the east side of Administration Wing and consists of a vestibule outfitted with aluminum storefront doors and glass block, covered projected landing, and concrete steps.

Large equipment rooms are constructed at the east and west ends of each of the four wings. The long end walls of these rooms (east and west) are equipped with aluminum blow-out panels while the north and south walls of these rooms are equipped with glass block panels. The north walls of the equipment rooms in Wings 2 and 4 are also equipped with an overhead door, raised concrete dock, and single, painted hollow metal door. The same is true for the south side of the equipment rooms for Wings 3 and 5. Two more painted hollow-metal egress doors are spaced along the north and south elevations of each wing. Wing 1 has a pair of hollow-metal doors and a raised concrete dock on the west side. Besides the glass block panels, windows are primarily limited to the first floor of each wing and the second floor of the corridor behind the Administration Wing.

West side of Wing 4. Note blow-out panels and glass block panels on the north side (left)

North side of Wing 5 and area between Wings 5 and Wing 1

South side of Wings 9 (near with stack) and 7 (far) looking east

Wing 9 was constructed to the west of Wing 7 in 1960. The wing was built using a concrete post and beam structural system with concrete block infill panels. Wing 9 has a

low-pitched broken gable roof, and a 3-story vent stack is located on its south side. The wing has a different layout than the other wings due to its use for remote handling work with highly radioactive materials. The west elevation of this wing is equipped with both single and double hollow metal doors. Instead of a raised dock, the doors have concrete steps.

Additional building equipment includes signage, high-powered light fixtures, and a warning system. The roof is further equipped with lightning rods, vent stacks, and air handling equipment.

Integrity Issues and Potential for Contamination

TA-3-29 has been modified over time, including minor changes to docks, doors, and windows. Interior modifications, such as the upgrading or clean up of laboratory spaces, were made primarily to accommodate the evolving scientific mission of the facility. Other than this minor loss of integrity, the CMR Building remains very true to its original construction design.

The CMR Building has a high potential for contamination due to its association with hazardous and radioactive materials. TA-3-29 is a nuclear facility and is not open to the public.

Eligibility Recommendation

The CMR Building is eligible for listing in the National Register of Historic Places. This determination is made under Criterion A of the National Historic Preservation Act due to the building's association with important events during the Cold War years at Los Alamos. The CMR Building was essential in the development of America's nuclear arsenal from the 1950s to the end of the Cold War.

TA-3-29 is also eligible for the National Register under Criterion C (architectural and engineering significance) due to the building's distinctive functional and scientific design, which is highlighted by its massive concrete construction. The layout of each laboratory wing, with an interior core of laboratory spaces surrounded by offices located along exterior walls, is a unique functional design related to work with radioactive and other hazardous chemicals and materials.

References Cited

Garcia, Kari, and Alysia McLain
1999 *Decontamination and Decommissioning of Structure TA-3-156 and Building TA-3-163.* Historic Building Survey Report No.174, Los Alamos National Laboratory, Los Alamos, New Mexico.

Los Alamos Scientific Laboratory (LASL)
1964 "The President's Visit." *LASL News*, December 13, 1962.

Appendix: LANL Historic Building Inventory Form for TA-3-29

LANL TA- Building # 03-0029

Camera PN# 984231

Frame #s DCP_4791 through DCP_-4799, and DCP_4801

Surveyor(s) S. McCarthy, J. Ronquillo, N. Naranjo

Date 6/16/2006

Los Alamos National Laboratory CRT
Historic Building Survey Form

Building Name Chemistry Metallurgy Research Building (CMR) UTMs easting 380674 northing 3970294 zone 13

Legal Description: Map Frijoles Quad tnsp 19N range 6E sec 17 & 20

Current Use/ Function Chemistry Metallurgy Research Building (CMR) Original Use/ Function Chemistry Metallurgy Research Building (CMR)

Date (estimated) Date (actual) 1952 Property Type Laboratory/Processing

Type of Construction

Pre-Fabricated Metal ☐ Steel Frame ☐ Wood Frame ☐ CMU ☐ Reinforced Concrete ☑

Other Type of Construction 2 stories plus basement # of Stories 3

Foundation Reinforced Concrete

Exterior CMU-Exterior ☐ Reinforced Concrete-Exterior ☑ Steel (galvanized) ☐ Steel (corrugated) ☐

Wood Siding ☐ Asbestos Shingles-Exterior ☐ In-Fill Panels ☐ Other-Exterior Aluminum blow-out panels on east and west ends of each wing.

Exterior Treatment (painted, stuccoed, etc) Painted

Exterior Features (docks, speakers, lights, signs, etc) Additional building equipment includes signage, high-powered light fixtures, and a warning system. The roof is further equipped with lightning rods, vent stacks, and air handling equipment.

Addition CMU-Addition ☐ Reinforced Concrete-Addition ☐ Steel (galvanized)- Addition ☐ Wood ☐

Steel (corrugated)-Addition ☐ Asbestos Shingles-Addition ☐ Other- Addition

Exterior Treatment-Addition

Exterior Features-Addition Wing 9 - Concrete post and beam structural frame system with concrete block infill panels and a low-pitched broken gable roof.

Roof Form Slanted/Shed ☐ Gable ☐ Other Roof Type flat

Degree of Pitch/ Slope Slight

Roof Materials Corrugated Metal ☐ Rolled Asphalt ☐ Asbestos Shingles ☐ 4-Ply Built Up ☐

Other Roof Materials Concrete with built-up roofing system

Window Type Casement ☐ Single Hung Sash ☐ Double Hung Sash ☐ Fixed Window ☐

Other Window Type

# of Each Window Type/ Comments

Glass Type Clear ☐ Wire Glass ☐ Opaque ☐ Painted Glass ☐ Glass Block ☑

Light Pattern: Panels of glass block on the north & south sides of wings, east side of the Administration Wing

Door Type

Personnel Door Types — Exterior: Fire Door ☐ Single ☑ Double ☑ Roll-up ☐ Sliding ☐ Hollow Metal ☑ Solid Wood ☐ 1/2 Glazed ☐ Paneled ☐ Louvered ☐ Painted ☑

Personnel Door Types — Interior: Fire Door ☐ Single ☐ Double ☐ Roll-up ☐ Sliding ☐ Hollow Metal ☐ Solid Wood ☐ 1/2 Glazed ☐ Paneled ☐ Louvered ☐ Painted ☐

Equipment Door Types — Exterior: Fire Door ☐ Single ☑ Double ☑ Roll-up ☑ Sliding ☐ Hollow Metal ☑ Solid Wood ☐ 1/2 Glazed ☐ Paneled ☐ Louvered ☐ Painted ☑

Equipment Door Types — Interior: Fire Door ☐ Single ☐ Double ☐ Roll-up ☐ Sliding ☐ Hollow Metal ☐ Solid Metal ☐ 1/2 Glazed ☐ Paneled ☐ Louvered ☐ Painted ☐

# of Each Door Type/Comments: Pair of aluminum storefront doors on east side of Admin Wing; overhead doors on north, south and west elevations of each of the 7 wings.

Interior Wall Gypsum Board ☑ Reinforced Concrete- Interior ☑ CMU- Interior ☑ Plywood ☐ Other- Interior: metal panel

In-Wall Electrical Wiring ☑ On-Wall Electrical Wiring ☑

Ceiling Drop Ceiling ☑

Interior Comments (Equipment, etc): ceiling: metal panel, acoustical panel, and reinforced concrete ceiling (exposed)

Degree of Remodeling: Moderate

Condition Excellent ☑ Good ☐ Fair ☐ Deteriorating ☐ Contaminated ☐ Burned ☐

Associated Building ☐

If yes, list building names and #s

Integrity: Excellent

Significance: Eligible

Eligible Under Criterion A ☑ B ☐ C ☑ D ☐ Not Eligible ☐

DOE Themes

Nuclear Weapon Components and Assembly ☐ Nuclear Weapon Design and Testing ☑ Nuclear Propulsion ☐

Peaceful Uses: Plowshare, Nuclear Medicine, Nuclear Energy, Nuclear Science ☐

Energy and Environment: Research and Design Projects ☐

LANL Themes

Weapons Research and Design, Testing, and Stockpile Support ☑ Super Computing ☐

Reactor Technology ☐ Biomedical/Health Physics ☐ Strategic and Supporting Research ☐

Environment/Waste Management ☐ Administration and Social History ☐ Architectural History ☐

Recommendations/ Additional Comments

Architectural Features (elevations)

Total sq ft 550,000 **Architect/ Builder** Los Alamos Scientific Laboratory; The Zia Company; Los Alamos National Laboratory; Stanley Engineering Company

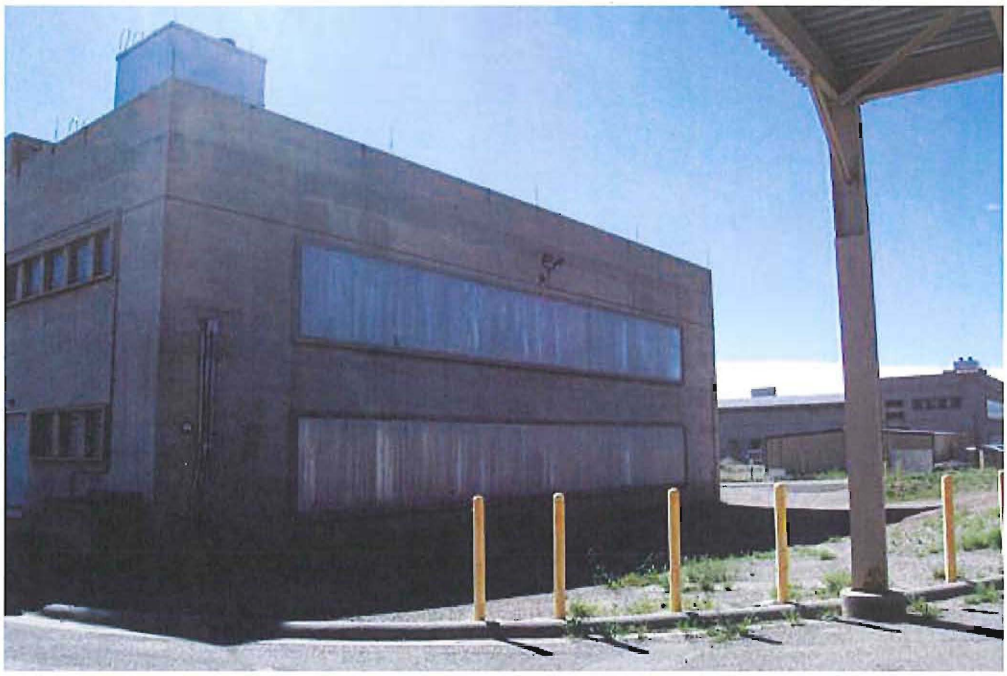
Alterations 1960 Wing 9 addition.

List of Drawings (Cntrl + Enter for para break)

Cold War Era Buildings Historic Context
TA-3-29
C. M. R. Building
A-1, Sheet 1 of 3
Basement Floor Plan
July 2009

Cold War Era Buildings Historic Context
TA-3-29
C. M. R. Building
A-2, Sheet 2 of 3
First Floor Plan
July 2009

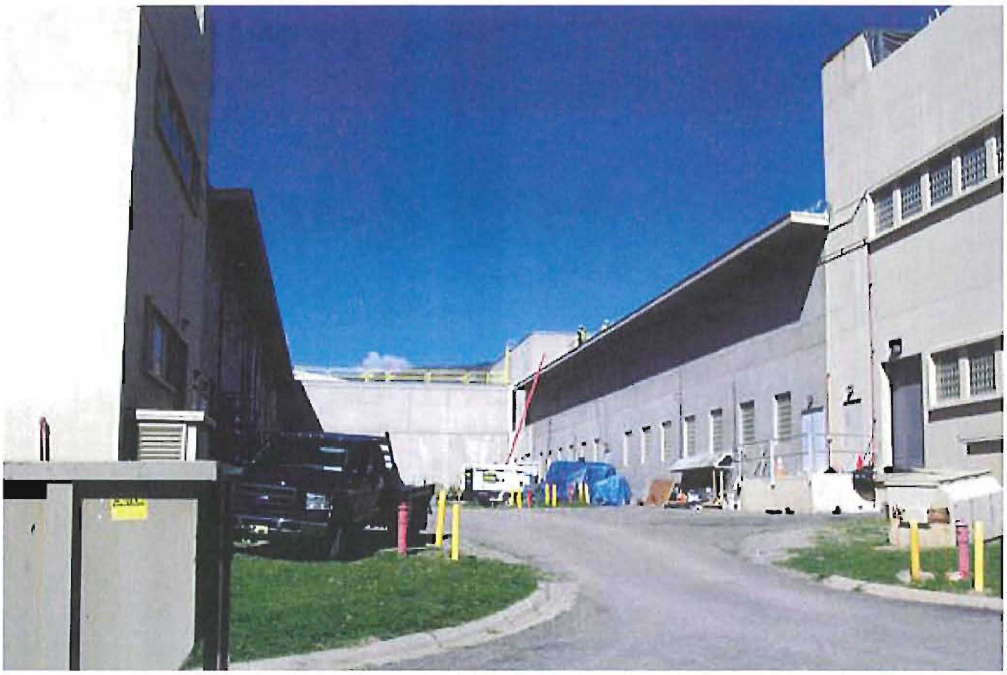
Cold War Era Buildings Historic Context
TA-3-29
C. M. R. Building
A-3, Sheet 3 of 3
Second Floor Plan
July 2009



West side of Wing 4, facing southeast

South side of Wings 9 and 7, facing east northeast

Administration Wing and main entrance, facing west

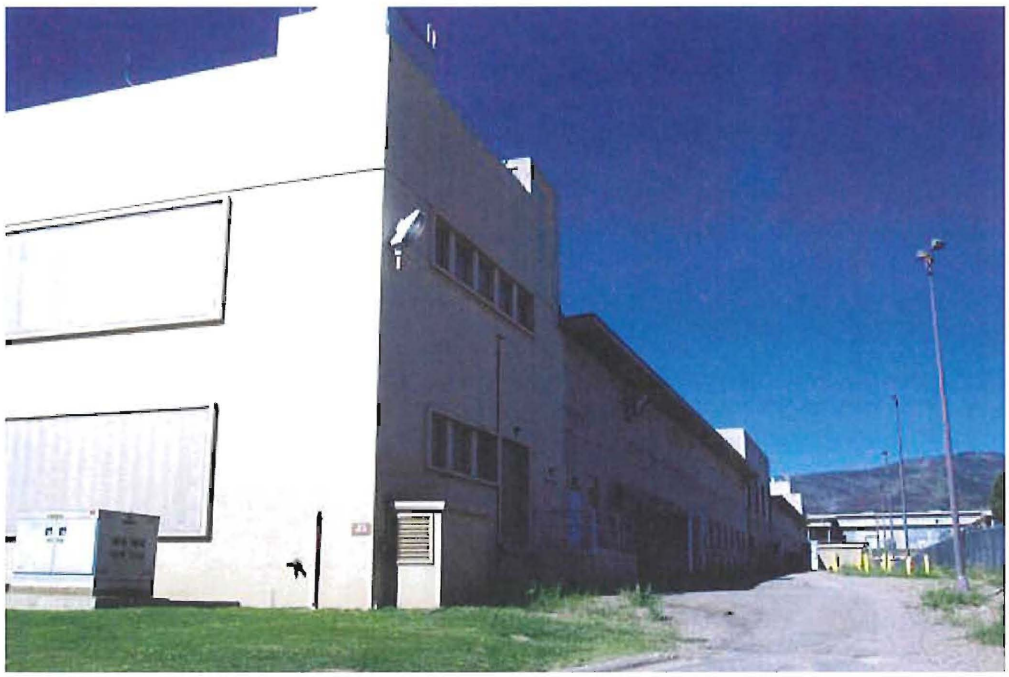


Area between Wing 7 (left) and Wing 3 (right), facing west northwest

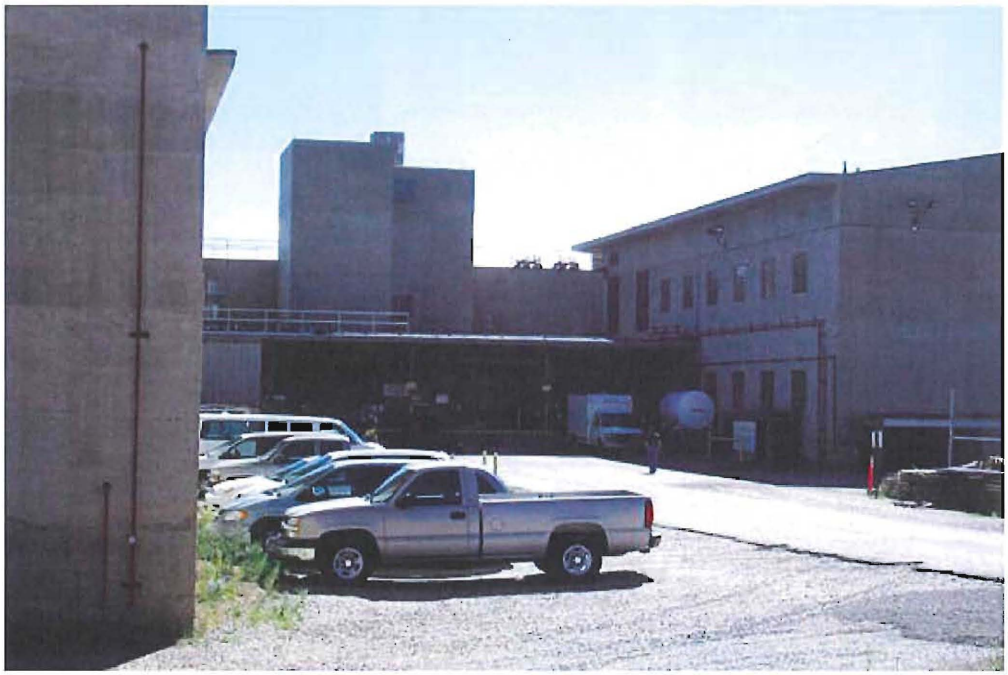
East side of Wings 7 (near), 3 (center), and 2 (far), facing north northwest

East side of Wings 2 (near), 3 (center), and 7 (far), facing south southwest

North side of Wings 4 and 2, facing east southeast

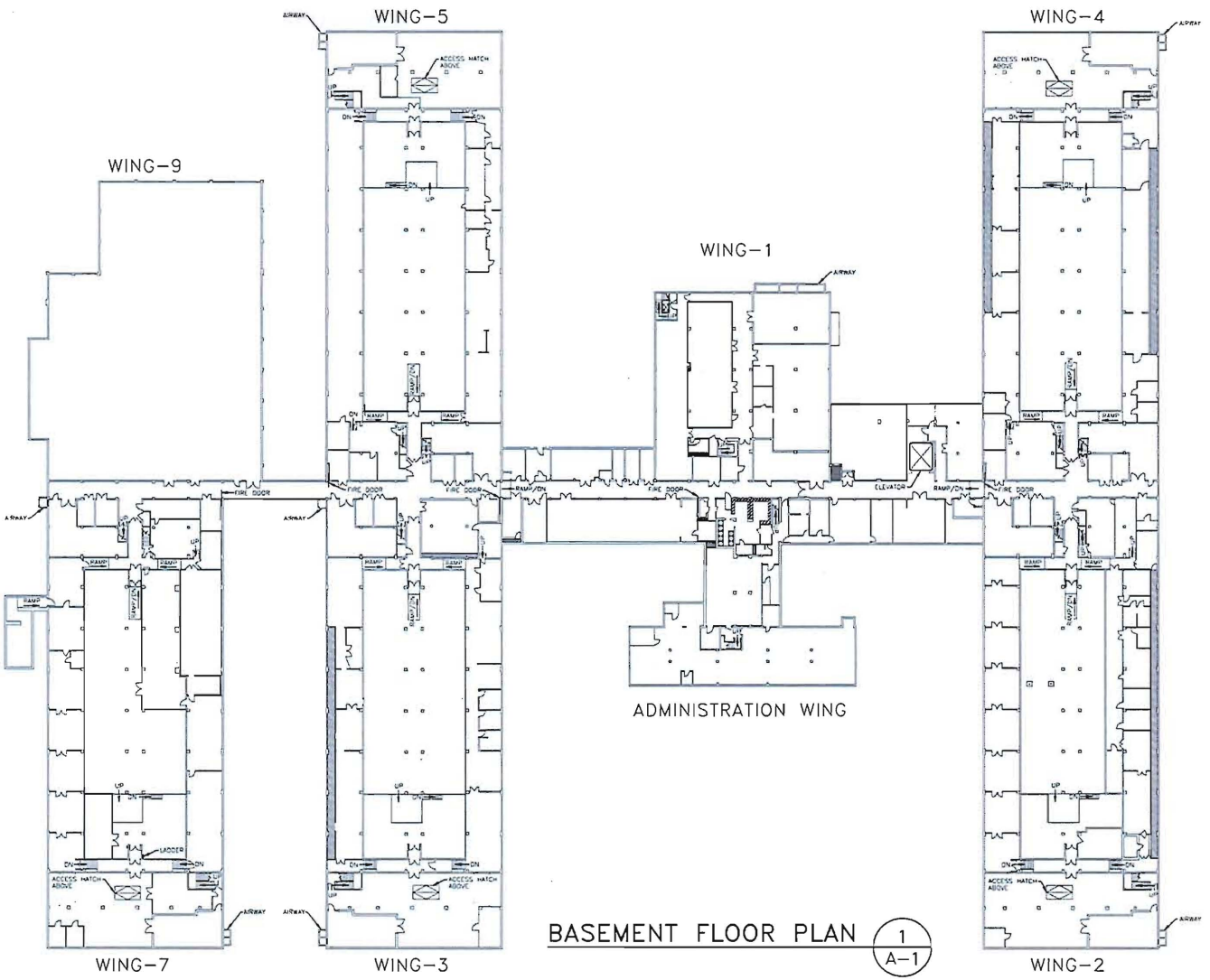


North side of Wings 2 and 4, facing west southwest



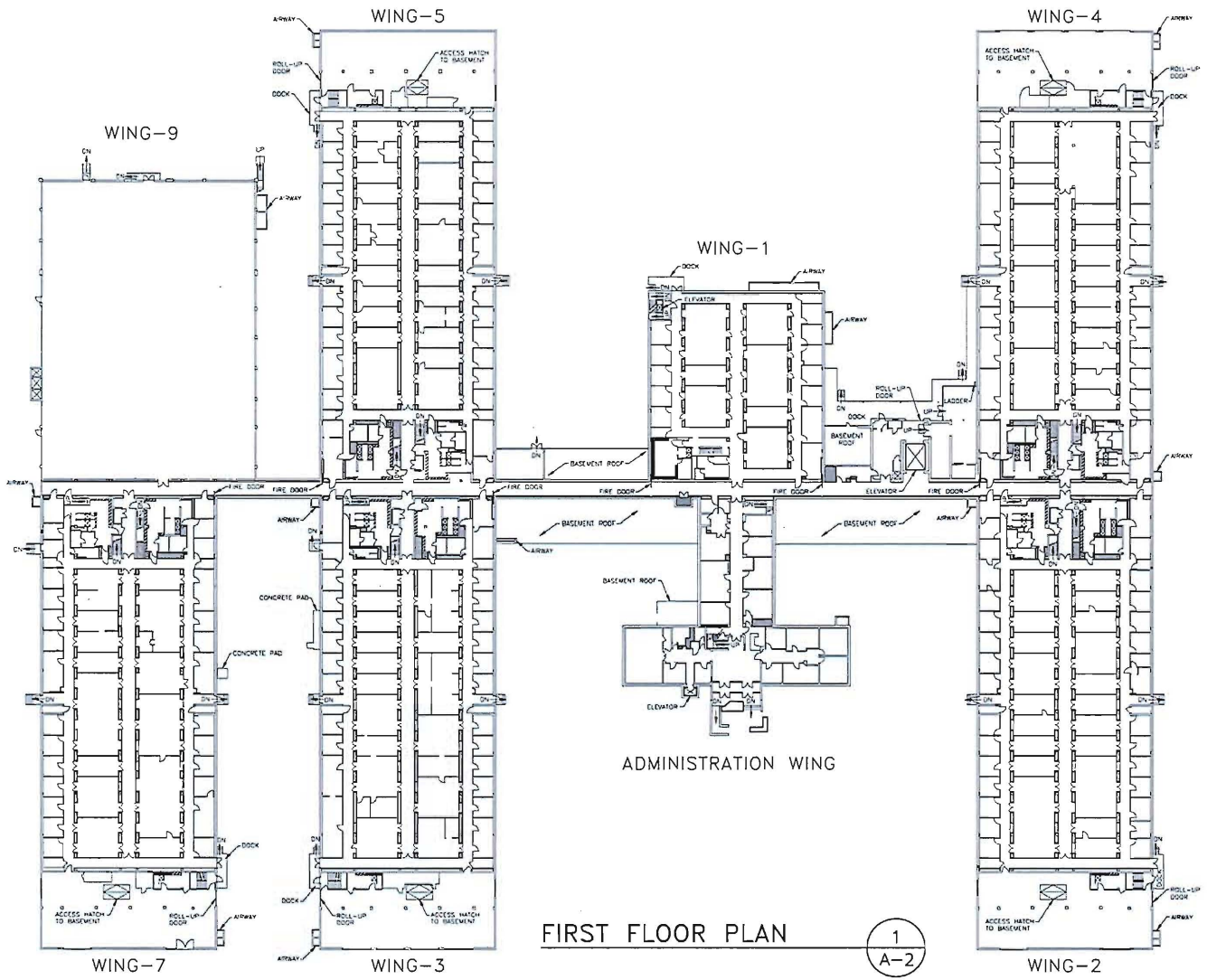
Area between Wing 4 (left) and Wing 1 (right), facing southeast

Area between Wing 1 and Wing 5 (right), facing southeast

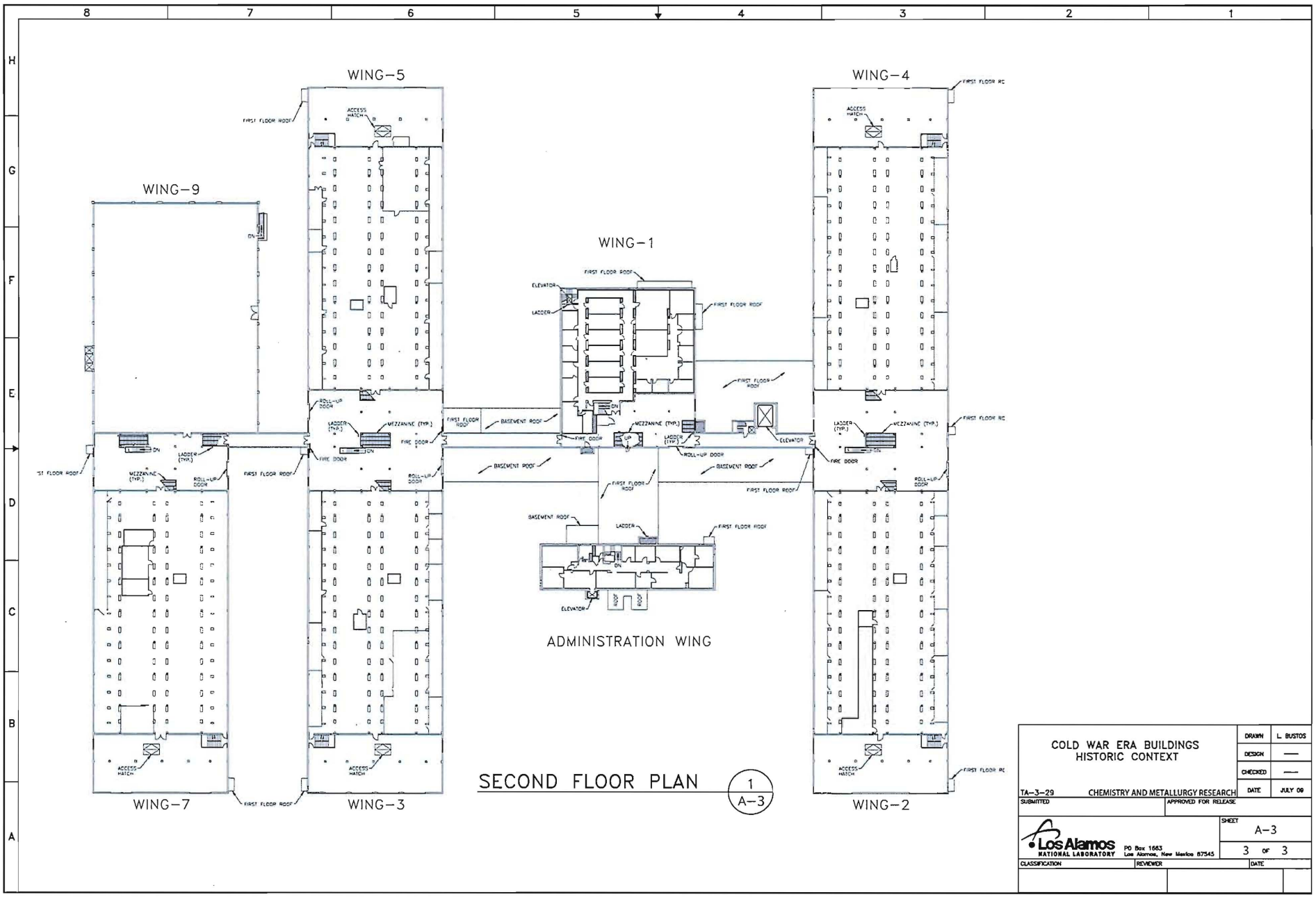


BASEMENT FLOOR PLAN 1/A-1

COLD WAR ERA BUILDINGS HISTORIC CONTEXT		DRAWN	L. BUSTOS
		DESIGN	—
		CHECKED	—
TA-3-29	CHEMISTRY AND METALLURGY RESEARCH	DATE	JULY 09
SUBMITTED	APPROVED FOR RELEASE		
Los Alamos NATIONAL LABORATORY PO Box 1663 Los Alamos, New Mexico 87545		SHEET	A-1
			1 OF 3
CLASSIFICATION	REVIEWER	DATE	



COLD WAR ERA BUILDINGS HISTORIC CONTEXT	DRAWN: L. BUSTOS
	DESIGN: —
	CHECKED: —
TA-3-29 CHEMISTRY AND METALLURGY RESEARCH	DATE: JULY 09
SUBMITTED	APPROVED FOR RELEASE
Los Alamos NATIONAL LABORATORY PO Box 1663 Los Alamos, New Mexico 87545	SHEET: A-2
	2 OF 3
CLASSIFICATION	REVIEWER / DATE



SECOND FLOOR PLAN

1
A-3

COLD WAR ERA BUILDINGS HISTORIC CONTEXT		DRAWN	L. BUSTOS
		DESIGN	—
		CHECKED	—
TA-3-29	CHEMISTRY AND METALLURGY RESEARCH	DATE	JULY 09
SUBMITTED	APPROVED FOR RELEASE		
Los Alamos NATIONAL LABORATORY PO Box 1663 Los Alamos, New Mexico 87545		SHEET	A-3
			3 OF 3
CLASSIFICATION	REVIEWER	DATE	