

LA-UR-01-4833

Addition to Control Bunker TA-36-12

Historic Building Survey Report No. 196

Los Alamos National Laboratory

**August 31, 2001
Survey No. 855**

Prepared for the Department of Energy,
National Nuclear Security Administration
Los Alamos Area Office

prepared by

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Cultural Resource Managers

ESH-20 Cultural Resources Team
Environment, Safety, and Health Division
LOS ALAMOS NATIONAL LABORATORY

Abstract

In July of 2001, an historic building survey was conducted for the proposed addition to building TA-36-12. This property is located on Department of Energy land in Technical Area (TA) 36 at Los Alamos National Laboratory.

Built in 1950, Building TA-36-12 is the control bunker for the Lower Slobbovia firing site. A new structure to be located north of building 12 is being proposed to increase capability after the loss of firing points TA-40-4 and -15 following the Cerro Grande Fire. The addition to TA-36-12 will allow the building to continue functioning as a control bunker. Because this property is 50 years of age an historic building assessment (a New Mexico Historic Building Inventory Form, building plan drawings, and photographs) has been included in this report.

This historic building assessment has determined that building TA-36-12 is eligible for the National Register of Historic Places based upon it's role as the control bunker for all explosives testing conducted at the Lower Slobbovia firing site. Since the proposed construction at building 12 will not affect those characteristics of the structure that make it eligible for the National Register, the New Mexico State Historic Preservation Officer (SHPO) is requested to concur with a "Determination of No Adverse Effect" for the proposed undertaking.

As a result of this historic building survey, this project complies with the National Historic Preservation Act of 1966 (as amended).

Provenience and Environmental Setting

Location: Technical Area (TA) 36 (Kappa Site) Los Alamos National Laboratory (LANL)

Land Manager: The Department of Energy (DOE)

Legal Description: Township 19N Range 6E Section Unplatted

Maps: USGS Frijoles Mountain 7.5 Minute Series (Appendix A, Maps 1 and 2)

Topography: Potrillo Canyon

Nearest Drainage: Potrillo Canyon

Elevation: 2018 meters (6620 feet)

Current Land Use: Developed firing site in TA-36

Project Description

TA-36-12 is listed as a communications/control center for the Lower Slobbovia firing site. The proposed addition involves the construction of a 600 sq ft blast resistance room along the north side of building 12. The addition replaces the capability lost at firing sites TA-40-4 and TA-40-15 due to the Cerro Grande Fire. This site (TA-36-12) was chosen as a replacement for safety reasons because the distance between fuel load and the actual firing point is greater than what is available at TA-40 sites. It is not structurally feasible to join the addition to the original building therefore, the only modification to TA-36-12 will be an exterior doorway installed in the north wall. The "addition" will be constructed several inches north of the original building with a doorway in the south wall. A covering will be attached to enclose the "passageway" between the two structures to protect the entrances from weather.

Like the original structure, the addition will also be constructed of reinforced concrete, and the roof will be made of poured concrete in order to withstand the pressure from the test shots. The addition will be equipped with electrical power for lighting and programmatic test equipment. Helium gas from a compressed gas cylinder will be piped into the room for the equipment. This project will allow TA-36-12 to continue functioning as a control bunker for Lower Slobbovia firing site and the new programmatic equipment will enhance the building's original use.

Methods

In July 2001, an historic building evaluation was conducted for structure TA-36-12 (Appendix A, Map(s) 1 and 2) by Alysia D. McLain and Kari L. M. Garcia, Environment, Safety, and Health Division, Ecology Group (ESH-20), LANL.

The historic building evaluation was accomplished by first conducting a field visit to TA-36-12, the control bunker for Lower Slobbovia. A Los Alamos National Laboratory CRMT Historic Building Survey Form was completed and photographs were taken (Appendix B). Records research at LANL was also carried out, and existing drawings were compiled for the building.

Culture History Overview

World War II and Early Cold War (1942–1956)

A. Site Selection, Acquisition

In 1942, Albert Einstein wrote a letter to President Franklin Roosevelt warning him of a possible German atomic bomb threat (Rothman 1992). President Roosevelt, acting on Einstein's concerns, gave approval to develop the world's first atomic bomb and appointed Brigadier General Leslie Groves to head the "Manhattan Project." Groves, in turn, chose Robert Oppenheimer to coordinate the design of the bomb.

A single research facility, isolated and secret, was proposed. General Groves had several criteria: security, isolation, a good water supply, an adequate transportation network, a suitable climate, an available labor force, and a locale west of the Mississippi located "at least 200 miles from any international border or the West Coast" (Rothman 1992). Oppenheimer, who had visited the Pajarito Plateau on a horseback trip, suggested the Los Alamos Ranch School.

B. Manhattan Project (1942–1945)

A suitable site selected, Oppenheimer and his staff moved to Los Alamos to begin work. The recruitment of the country's "best scientific talent" and the construction of technical buildings were top priorities. The University of California agreed to operate the site, code name "Project Y," under contract with the government (an arrangement that has continued to this day). Although the fission bomb was conceptually attainable, many difficulties still stood in the way of producing a usable weapon. Technical problems included the timing of the release of energy from fissionable material and the engineering aspects of producing a deliverable device. Nuclear material and HE studies were of immediate importance (Los Alamos National Laboratory 1995).

Two bomb designs appeared to be the most promising: a uranium "gun" method and a plutonium "implosion" method. The "gun" method bomb involved bringing fissionable material together to form a critical mass by firing one subcritical mass of uranium-235 at another. This method led to the development of the "Little Boy" device. Scientists were less confident about the second "implosion" method, a design that necessitated the compression of fissionable material using HE. The compression action would increase the density of a slightly subcritical mass of plutonium-239 and cause a critical reaction (Los Alamos National Laboratory 1995). In 1944, due to the uncertainties surrounding the second design, the search began for an appropriate test site for the implosion method, later used in the "Fat Man" device. The Alamogordo Bombing Range in south-central New Mexico was selected. A trial run involving 100 tons of TNT was conducted at "Trinity Site" on May 7, 1945. This "dress rehearsal" provided measurement data and

simulated the dispersal of radioactive products. The Trinity test was planned for July, and its objectives were “to characterize the nature of the implosion, measure the release of nuclear energy, and assess the damage” (Los Alamos National Laboratory 1995). The HE components of the “Trinity” device were test assembled in building TA-16-516 at Los Alamos in an area known as V-Site. Other buildings at V-Site were used to prepare and finish the HE components and to run preliminary tests on the “Trinity” bomb (Wilder 1991). The world's first atomic bomb was successfully detonated in the early morning of July 16, 1945. “Little Boy,” the untested uranium gun-type bomb, was exploded over the Japanese city of Hiroshima on August 6, 1945. “Fat Man” was exploded over Nagasaki three days later on August 9, 1945, thus essentially ending the war with Japan.

C. Early Cold War Era (1946–1956)

The Manhattan Project had come to a close with the end of World War II (WWII), and many Los Alamos scientists and site workers went back to their prewar existences. The future of Los Alamos was in question. With the beginning of the Cold War, continued weapons research was a top priority. Norris Bradbury had been appointed director of the Laboratory following Oppenheimer’s departure from Los Alamos. Bradbury felt that the nation needed “a laboratory for research into military applications of nuclear energy” (Los Alamos National Laboratory 1993a). In 1945, stockpiling and development of additional atomic weapons was an important mission. In 1946, the Laboratory became involved in the technical direction of the atmospheric testing program in the Pacific, dubbed “Operation Crossroads.” Later in 1946, the U.S. Atomic Energy Commission (AEC) was established to act as a civilian steward for the new atomic technology born of WWII. The AEC formally took over the Laboratory in 1947, making a commitment to retain Los Alamos as a permanent weapons research facility. Postwar weapons research revolved around the development of advanced fission weapons and, acting on an idea born in 1942, the development of the hydrogen bomb. The combined work of Edward Teller and Stanislaw Ulam led to the beginning of the Laboratory's thermonuclear research program (Los Alamos National Laboratory 1993a).

In 1952, the first thermonuclear device, known as “Mike,” was detonated at Eniwetok atoll in the Pacific (Los Alamos National Laboratory 1993a). The Mike shot used liquefied deuterium fuel. The Castle-Bravo shot, conducted in the Pacific in 1954, was revolutionary in that it contained dry, solid thermonuclear fuel. Other early Cold War weapons-related developments include (1) from 1952 to 1956, “improvements to the primary stage of a nuclear weapon” and (2) in 1956, “the first use of plastic-bonded explosives in a nuclear explosion” (Los Alamos National Laboratory 1995).

Technical Area 36 (Kappa Site) Historical Background

TA-36 (Kappa Site) is bordered by TA-15 on the west and by TAs 18 and 54 on the north. TAs 68 and 39 are located along the southern boundary and State Road 4 to the east. Operations at TA-36 began in 1950 by GMX-8 and focused on explosive testing that supported weapons research and development. GMX-8 later became group M-3 of the Dynamic Testing Division (M-Division) and was eventually renamed the Explosives Application Group, M-8. In 1994 M-Division reorganized into the Dynamic Experimentation Division (DX-Division) and M-8’s

group name changed to the Field Operations and Experiment Support Group (DX-4). The area contains group offices, sanitary facilities, four firing sites (Eenie, Meenie, Minie, and Lower Slobbovia), and a storage magazine at Moe. Approximately 1, 500 explosives tests are conducted at TA-36 each year (Los Alamos National Laboratory 1993b). The tests are generally described as being either stationary tests or penetration tests. Stationary tests involve a prefabricated shot assembly (containing explosives and various amounts of diverse metals and plastics and connected to detonator cables and monitoring instrumentation) that is placed on a wooden table at a firing point and detonated. Conversely, a penetration test involves firing a projectile out of a barrel towards a target.

In addition to the testing, TA-36 is responsible for such activities as storage and assembly of prefabricated metal and explosives, components, detonators, cables, and instrumentation (including X-ray machines) for shots. Drop tests involving dropping mock-up weapons from a predetermined height to a pad below, were also conducted at Lower Slobbovia (Los Alamos National Laboratory 1993b).

Description of Building

An addition to TA-36-12 is proposed. Appendix A contains maps indicating the location of the building and the proposed addition. The Historic Building Inventory Forms, plan drawings, and photographs can be found in Appendix B.

TA-36-12 Control Bunker

Building Name: TA-36-12 Original Name: Control Bunker, Building 12

Location:

City – Los Alamos, New Mexico

County – Los Alamos

UTMS – Zone 13 Easting Northing

Legal Description – Township 19 North, Range 6 East, Unplatted

Surroundings – TA-36 is the site of the Field Operations and Experiment Support Group (DX-4). The technical area contains a group office, sanitary facilities, four firing sites (Eenie, Meenie, Minie, and Lower Slobbovia) and a storage magazine at Moe.

Construction Date: July 21, 1949 to June 2, 1950

Original Use: TA-36-12 was originally used as the control bunker for the firing site Lower Slobbovia.

Use History: Building TA-36-12 maintains it's original function as a control bunker.

Use at Time of Survey: TA-36-12 is currently used as a control bunker at the firing site Lower Slobbovia.

Condition at Time of Survey: Good

Building Description: (See Appendix B)

Building style-Reinforced concrete bunker with a concrete masonry unit (CMU) roof.

Foundation –The foundation consists of a concrete slab with smooth integral cement finish that is covered with rubber tile on a felt base.

Wall material/ surface –The exterior surface is constructed of reinforced concrete. The interior walls are made of plywood and concrete.

Architectural Features – Control Bunker, TA-36-12 is a reinforced concrete and CMU structure. There is a covered trench in the floor and the entire building is sloped for drainage purposes.

There are two hollow metal, painted personnel doors located along the west elevation of TA-36-12. Small metal canopies cover both doors. The southern half of the elevation extends further west than the northern half. A tank, some piping and several trash cans are also visible along this elevation.

Most of the north elevation is hidden in the hillside, however there is a wing wall that extends west from this elevation. The south and east elevations of TA-36-12 are also built into the hillside and therefore are only partially visible. The 600 sq. ft. addition will be located along the north side of TA-36-12 and will be level with the rest of the building. The architectural and material characteristics of the addition will resemble those of the original structure.

TA-15-376 is located above (atop the hill) TA-36-12 along the east side of the building.

Remodeling History: In 1976 a fire detection system was installed at TA-36-12. The original firing mount was enlarged in 1986 to provide a firing point for the newly installed sled track (Los Alamos National Laboratory 1993b:5-39).

Associated Buildings: None.

Contamination Information: Prior to the 1960s, burn pits were used to burn firing site debris. Use of the two contaminated burn pits was discontinued when MDA AA was opened. Also referred to as potential release site (PRS), MDA AA or PRS 36-001 is located in Potrillo Canyon, approximately 300 ft. southwest of TA-36-12. Possible contaminants at this site include metals such as barium, chromium,

zinc, lead, and depleted or natural uranium. Small amounts of explosives may also be present at PRS 36-001. Material remains from test shots were collected in this area and loaded into pickup trucks. The material was then taken to 2 to 4 trenches where it was unloaded by hand and burned in the trenches. The trenches were then covered with 4 ft. of soil. Currently these trenches contain burned residue from the firing site debris, including wood, nails and small amounts of sand that is contaminated with barium, uranium, other metals, and plastics. In accordance with the New Mexico solid waste regulations, the last active trench site was closed on May 12, 1989. The trenches were covered and the entire area was graded. Combustible firing site debris is still burned on the ground surface in a permitted area that is located 100 to 300 ft. west of PRS 36-001 (Los Alamos National Laboratory 1993b:5-1).

National Register Eligibility Determination

The addition will have a “no adverse effect” on the original structure and therefore the integrity and historical significance will not be affected. Building 12 will continue to be used as a control bunker and replace lost capabilities at TA-40-4 and 15. The State Historic Preservation Office is requested to concur with the eligibility determination and our assessment of “no adverse effect” for this undertaking.

As a result of this historic building survey, this project complies with the National Historic Preservation Act of 1966 (as amended).

References Cited

Los Alamos National Laboratory

- 1993a *Los Alamos: Beginnings of an Era 1943-1945*. Los Alamos Historical Society, Los Alamos, New Mexico.
- 1993b *RFI Work Plan for Operable Unit 1130: Environmental Restoration Program*. LA-UR-93-1152, Los Alamos National Laboratory, Los Alamos, New Mexico.
- 1995 *Dateline: Los Alamos, Special Issue, LALP -95-2-6&7*. Los Alamos National Laboratory, Los Alamos, New Mexico.

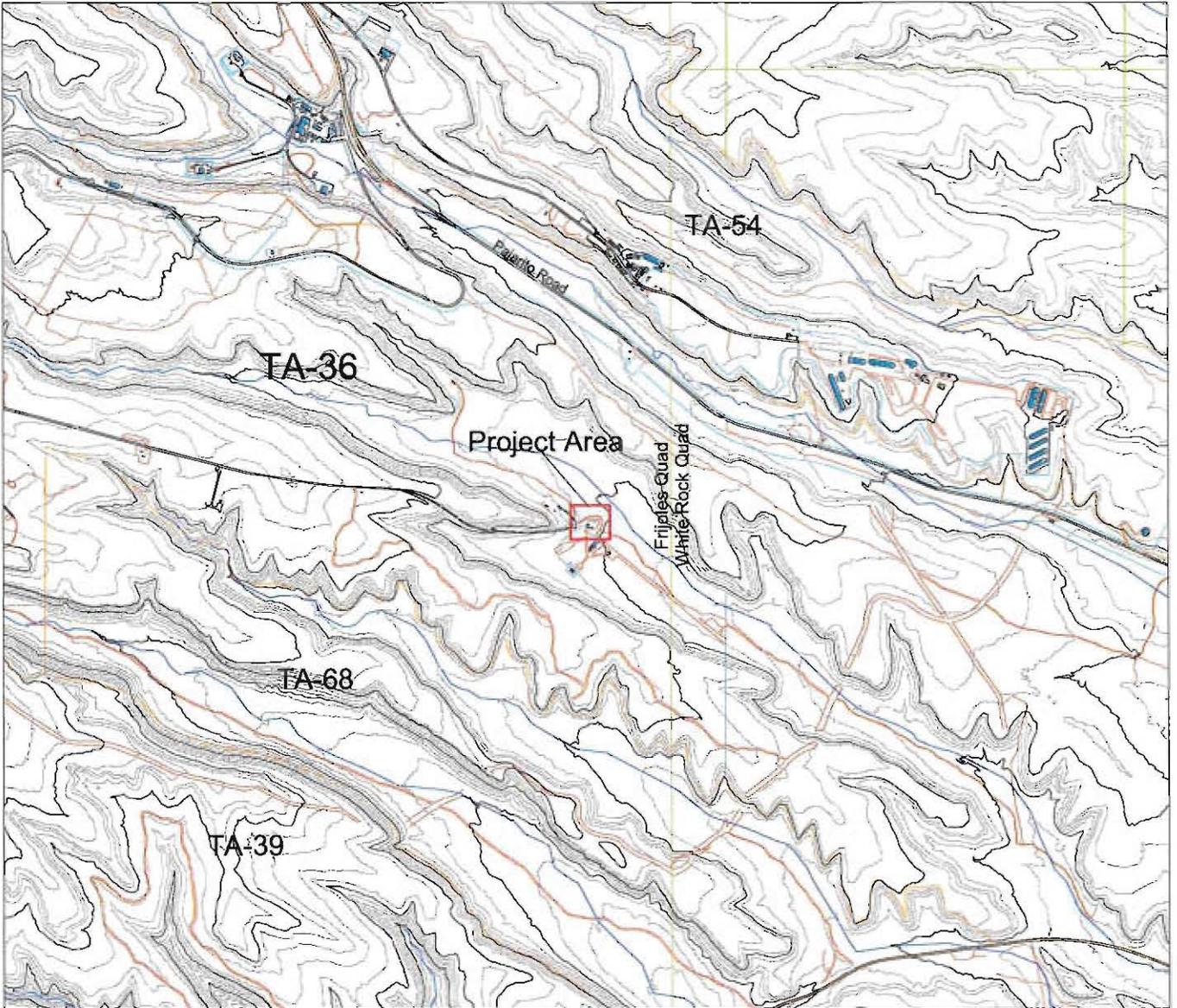
Rothman, Hal

- 1992 *On Rims and Ridges, The Los Alamos Area Since 1880*. University of Nebraska Press, Lincoln.

Wilder, Edward, Jr.

- 1991 Early S-Site Experiences. In *Manhattan District History: Nonscientific Aspects of Los Alamos Project Y, 1942 through 1946*. Written by Edith C. Truslow, edited by Kasha V. Thayer. Los Alamos Historical Society, Los Alamos, New Mexico.

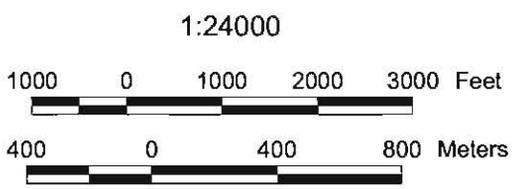
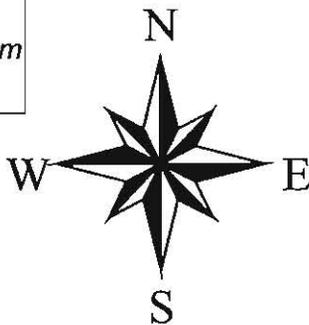
Appendix A Maps



Los Alamos
National Laboratory
Cultural Resources Management Team
ESH-20 Ecology Group

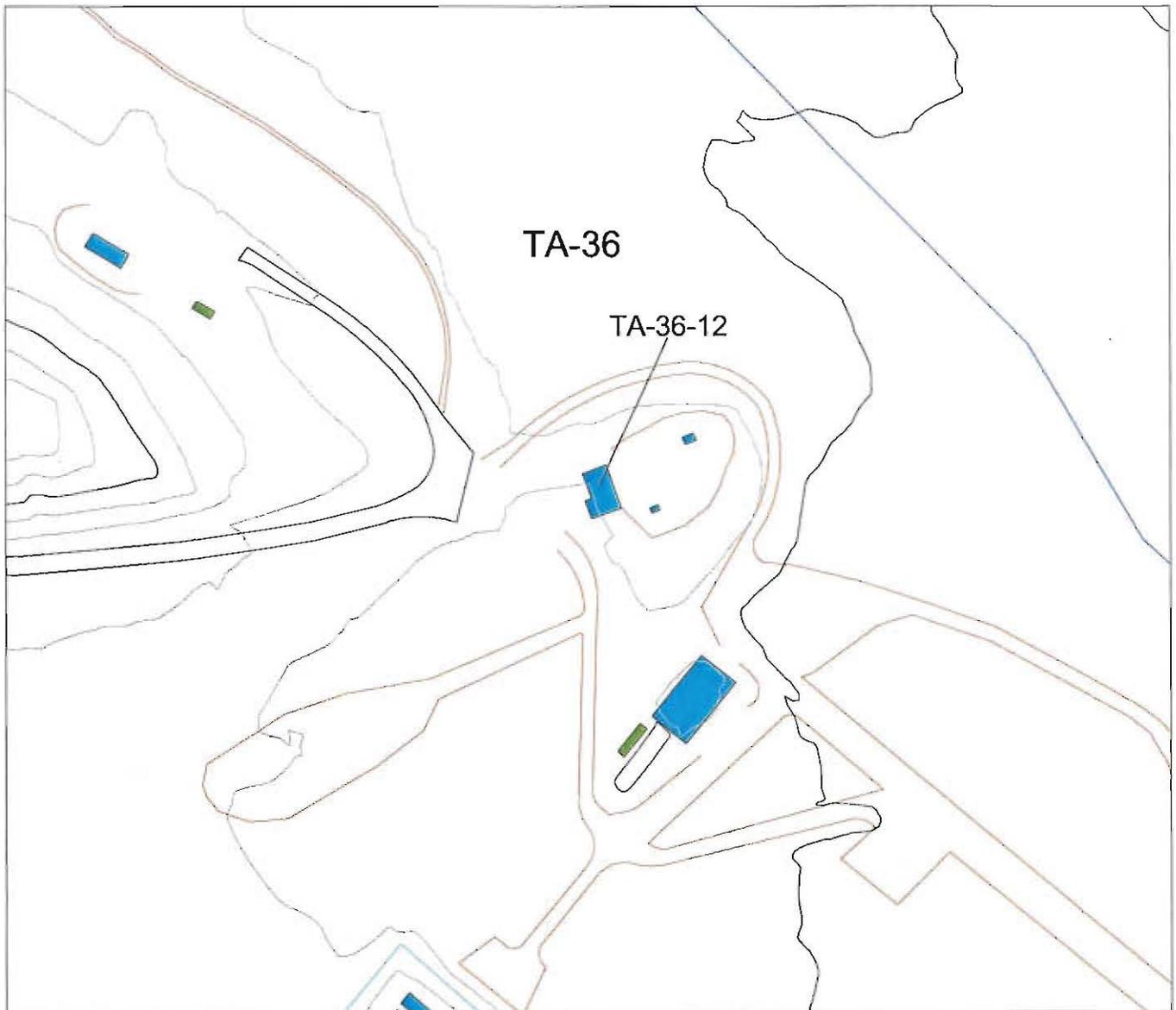
TA-36-12
Addition

TA-36



- 20 Foot Contours
- 100 Foot Contours
- Techarea
- Drainage
- Township, Section, Range
- USGS 7.5 Minute Quad
- Roads
- Road dirt
- Park pave
- Park dirt
- Ind fence
- Sec fence
- Perm bldg
- Tmp bldg
- Ugr bldg

Map 1



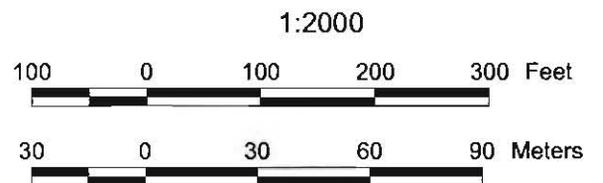
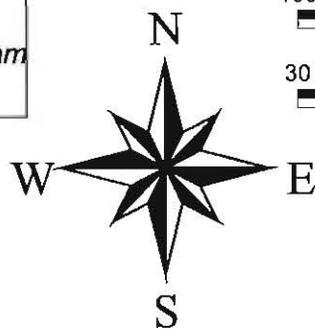
Frijoles Quad

**Los Alamos
National Laboratory**

*Cultural Resources Management Team
ESH-20 Ecology Group*

**TA-36-12
Addition**

TA-36



- 20 Foot Contours
- 100 Foot Contours
- Techarea
- Drainage
- Township, Section, Range
- USGS 7.5 Minute Quad
- Roads
- Road dirt
- Park paved
- Park dirt
- Ind fence
- Sec fence
- Permbldg
- Tnpbldg
- Ugrdbldg

Map 2

Appendix B
Los Alamos National Laboratory CRMT Historic Building Survey Form,
Photographs, and Drawings

ID 1

LANL TA Building # TA 36-12

Camera Christopher Robin

Frame #s 210-220

Surveyor(s) Alan Madsen & Alysia McLain

Date 7/21/2001

Los Alamos National Laboratory CRMT
Historic Building Survey Form

Building Name Control Bunker UTMs easting 386779 northing 3965272 zone 13

Legal Description: Map USGS Frijoles 7.5 Minute Series tnspl 19N range 6E sec Unplatted

Current Use/ Function control bunker Original Use/ Function control bunker

Date (estimated) 1950 Date (actual) 7/21/1949 to 6/2/1950 Property Type Support

Type of Construction

Pre-Fabricated Metal Steel Frame Wood Frame CMU Reinforced Concrete

Other Type of Construction # of Stories 1

Foundation Reinforced Concrete

Exterior CMU-Exterior Reinforced Concrete-Exterior Steel (galvanized) Steel (corrugated)
Wood Siding Asbestos Shingles-Exterior In-Fill Panels Other-Exterior

Exterior Treatment (painted, stuccoed, etc) none

Exterior Features (docks, speakers, lights, signs, etc) metal canopies above both doors

Addition CMU-Addition Reinforced Concrete-Addition Steel (galvanized)- Addition Wood
Steel (corrugated)-Addition Asbestos Shingles-Addition Other- Addition

Exterior Treatment-Addition none

Exterior Features-Addition unknown

Roof Form Slanted/Shed Gable Other Roof Type flat

Degree of Pitch/ Slope

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

Window Type Casement Single Hung Sash Double Hung Sash Fixed Window

Other Window Type none

of Each Window Type/ Comments N/A

Glass Type Clear Wire Glass Opaque Painted Glass Glass Block

Light Pattern N/A

Door Type Personnel Interior Single Roll-Up Hollow Metal 1/2 Glazed
Equipment Exterior Double Sliding Solid Wood Paneled
Louvered Painted

Door Comments _____

Interior Gypsum Board Reinforced Concrete- Interior Other- Interior _____
CMU- Interior Plywood
Drop Ceiling In-Wall Electrical Wiring On-Wall Electrical Wiring

Interior Comments (Equipment, etc) programmatic equipment; building contains covered trenches and is sloped for drainage

Degree of Remodeling Minor

Condition Excellent Good Fair Deteriorating Contaminated Burned

Associated Building

If yes, list building names and #s _____

Integrity _____

Significance Eligible

Eligible Under Criterion _____

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: R and D Projects

LANL Themes

Site Plan Available

Recommendations/ Additional Comments _____

Architectural Features (elevations)

Control Bunker, TA-36-12 is a reinforced concrete and CMU structure. There is a covered trench in the floor and the entire building is sloped for drainage purposes. Two hollow, metal, painted personnel doors are located along the west elevation of Building TA-36-12. Small metal canopies cover both doorways. The southern half of the elevation extends further west than the northern half. A tank, some piping and several trash cans are also visible along this elevation. Most of the north elevation is hidden in the hillside, however there is a wing wall that extends west from this elevation. The south and east elevations of TA-36-12 are also built into the hillside and therefore are only partially visible. The 600 square foot "addition" will be located several inches north of the original building. A covering will be attached to enclose the "passageway" between the two structures. The architectural and material characteristics of the addition will resemble those of the original structure. TA-15-376 is located above TA-36-12 (atop the hill) along the east side of the building.

Total sq ft 469

Architect/ Builder

Alterations

In 1976 a fire detection system was installed. The original firing mount was enlarged in 1986 to provide a firing point for the newly installed sled track.

Drawings

ENG-C 11752 (42 of 123)
Structural Layout- Floor Plan,
Roof Plan & Sections
May 25, 1949;
ENG-C 11780 (70 of 123)
Cover Assembly, Ventilation
Opening Assembly
May 21, 1949;
ENG-C 11825 (115 of 123)
Plan and Profile- Compressed Air
Line Bldg. Kappa-11 to Kappa-12
May 25, 1949;
ENG-R 2333 (1 of 1)
Floor Plan, Bldg. Kappa-12
December 21, 1961;
ENG-C 43084 (3 of 3)
Fire Detection Installation TA-11
and TA-36
December 7, 1976.

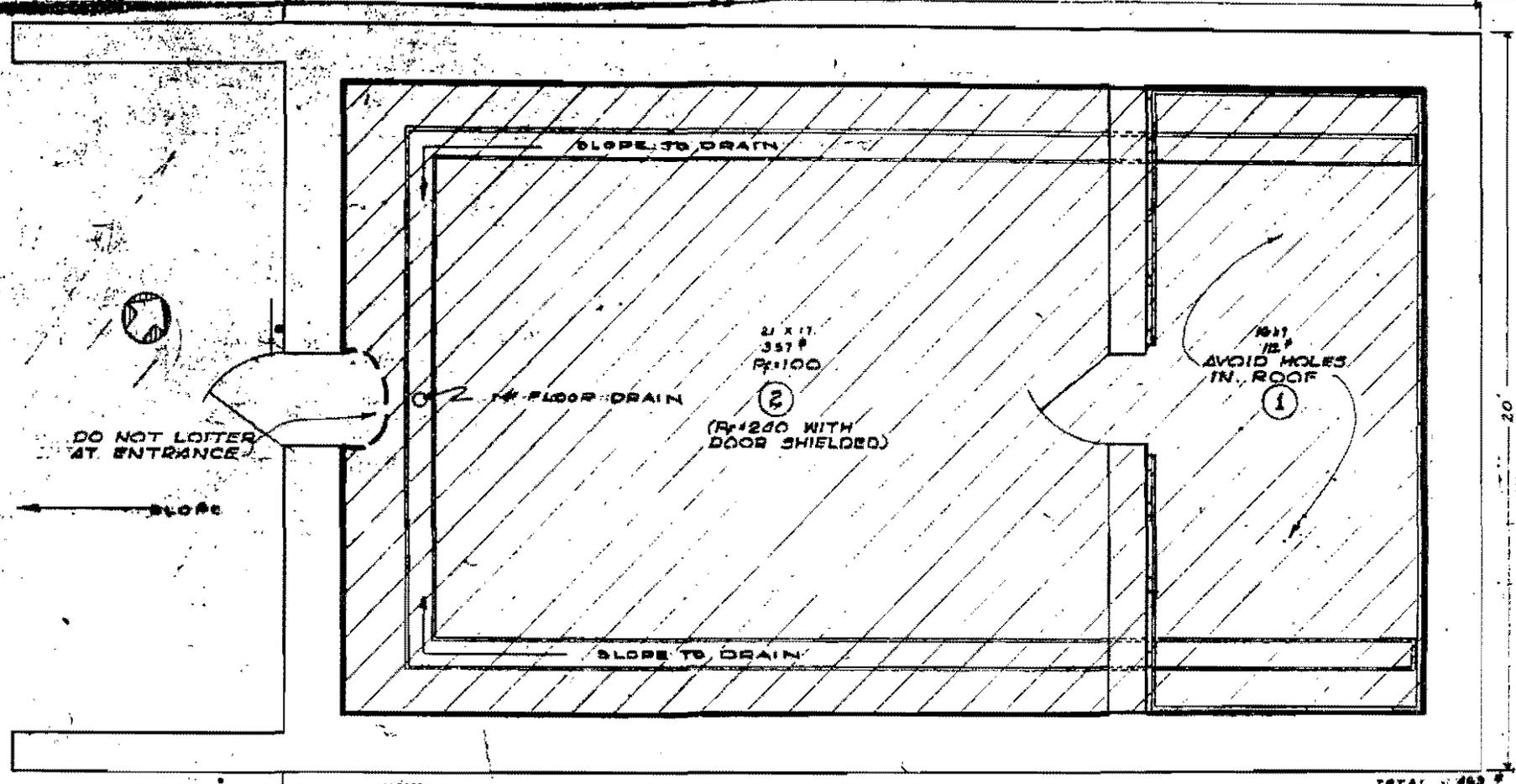


TA-36-12 West and South Elevations. White metal building, TA-15-376 in background.



TA-36-12 North and West Elevations. White metal building, TA-15-376 in background.

BEST SHOT POSSIBLE DUE TO CONDITION OF DRAWING



REC'D ENG-3 1-1-54 LOGGED 4-1-54 VAULT 2-1-54

DO NOT LOITER AT ENTRANCE

SLOPE

SLOPE TO DRAIN

SLOPE TO DRAIN

2 1/2 x 11
357 #
R#100

(R#200 WITH DOOR SHIELDED)

10 1/2 #
AVOID HOLES IN ROOF

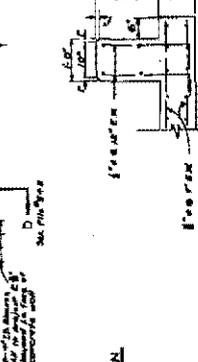
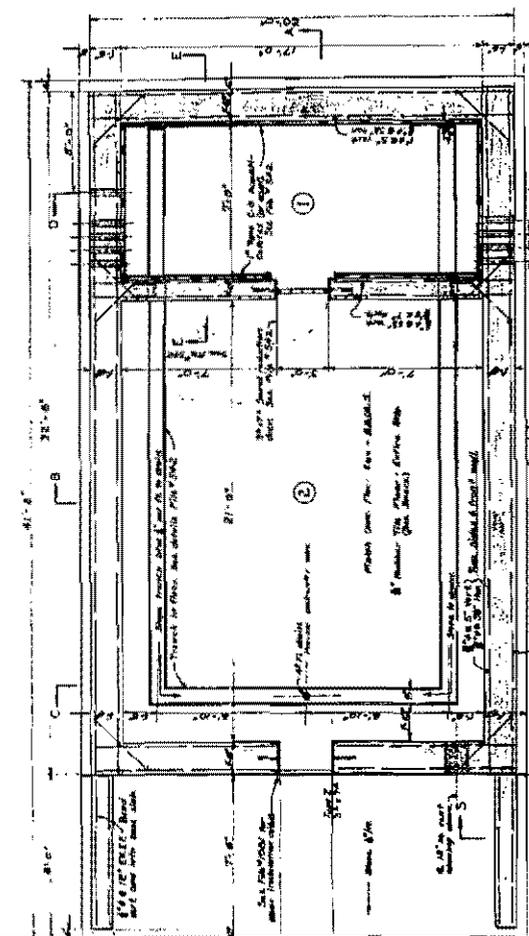
NOTES
 HIGHEST CAP. 20 S.F. PER PERSON 11
 SURVEYED BY TEAM NO. 5 JARWINE
 SURVEY COMP'D 10-8-51
 TYPE OF CONST. REINF. CONC.
 LOCATION OF SPACE BUNKER
 GROSS AREA 469 #
 EMER. NET SPACE 230 #
 WATER NO
 TELE YES
 ELEC. YES ENG-C 11780
 STEAM YES
 SAN. FAC. YES
 GAS NO

SIGN LOCATION
 FALLOUT SHELTER SURVEY

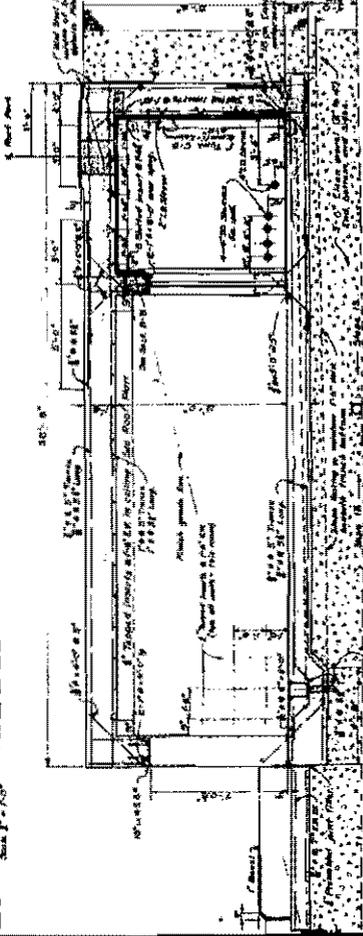
TOTAL 469 #
 OFFICIAL USE ONLY

LOS ALAMOS SCIENTIFIC LABORATORY UNIVERSITY OF CALIFORNIA ENGINEERING DEPARTMENT—LOS ALAMOS, NEW MEXICO		FLOOR PLAN BLDG. MAPPA-12 TA-5G MAPPA SITE	
APPROVALS:	DESIGN:	DATE:	SCALE:
ENG. GROUP: 3	DRAWN BY: ROYAL	12/21/51	1/8" = 1'-0"
DIVISION:	CHECKED BY: B.P.W.	SHEET:	SKETCH NO.
ENG. DEPT. OFFICE:		1 OF 1	ENG-22333

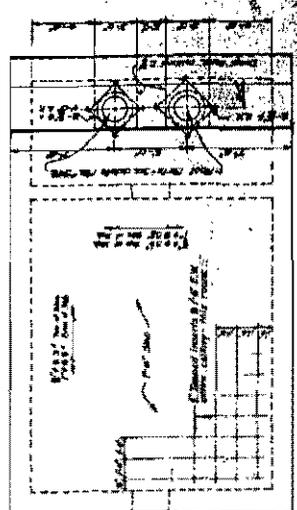
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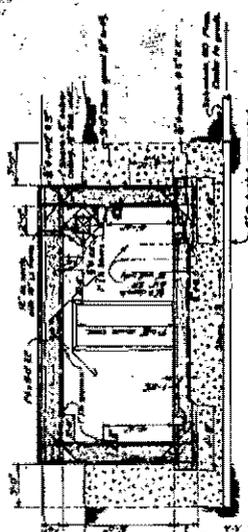
SECTION 3-3
Scale 1/4" = 1'-0"



SECTION 3-3
Scale 1/4" = 1'-0"



ROOF PLAN
Scale 1/4" = 1'-0"



SECTION 3-3
Scale 1/4" = 1'-0"

- GENERAL NOTES**
- 1 All concrete shall be Type 3000 and shall contain 1% strength of 8000 P.S.I.
 - 2 All S. & S. of concrete shall be with 1/2" of concrete used.
 - 3 All steel work shall be A36 steel.
 - 4 All steel work shall be protected against rust by zinc dipping.
 - 5 All steel work shall be protected against rust by zinc dipping.
 - 6 All steel work shall be protected against rust by zinc dipping.
 - 7 All steel work shall be protected against rust by zinc dipping.
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 - 21 All steel work shall be protected against rust by zinc dipping.
 - 22 All steel work shall be protected against rust by zinc dipping.

AS CONSTRUCTED DRAWING
 DRAWING NO. 11111
 DATE 11/11/11
 PROJECT 11111

SCALE - REDUCED	STREET LAYOUT	BLDG. PLAN - 1/2"	FLOOR PLAN, ROOF PLANS, SECTIONS	1/2" = 1'-0"
1/2" = 1'-0"	1/2" = 1'-0"	1/2" = 1'-0"	1/2" = 1'-0"	1/2" = 1'-0"
1/4" = 1'-0"	1/4" = 1'-0"	1/4" = 1'-0"	1/4" = 1'-0"	1/4" = 1'-0"
1/8" = 1'-0"	1/8" = 1'-0"	1/8" = 1'-0"	1/8" = 1'-0"	1/8" = 1'-0"
1/16" = 1'-0"	1/16" = 1'-0"	1/16" = 1'-0"	1/16" = 1'-0"	1/16" = 1'-0"